ANESTHESIA SUPPLEMENT — FOLLOWING PAGE 240

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THE METHODS OF CHAMPIONNIÉRE AND OF BARDENHEUER IN THE TREATMENT OF FRACTURES.

WM. W. RICHARDSON, M.D.,
Professor of Surgery, College of Physicians and Surgeons; Attending Surgeon, Los Angeles County Hospital,
LOS ANGELES, CAL.

During the past five years, the rich fracture material of the Los Angeles County Hospital, averaging at present 50 patients daily, has given us opportunity to try out some methods of fracture treatment under more favorable conditions than usually obtain, and I think it may be of interest to discuss some of the work we are doing. I am not able to give statistics of the number of cases treated, nor of the results obtained, but only impressions as to the value of the methods tried.

It has been our rule to limit the operative treatment of recent closed fractures to those in which we could not obtain by other means an apposition of the fragments sufficiently accurate to assure good function. When other means have failed to secure such apposition, we have not hesitated to use the open method, but in the main we have striven to improve our bloodless methods rather than to increase the number of our operative cases.

The purpose of this paper is to call attention to two methods with which we have had considerable experience, and which we believe to be a real advance in fracture treatment. I refer to the methods of Championniére and of Bardenheuer. Differing wholly in their technic, the methods of these two men have in common the substitution of mobilization for the time-honored tradition of immobilization in the treatment of fractures, and they have demonstrated by thousands of cases the fact that immobilization is not only unnecessary for the formation and consolidation of callus, but positively harmful in its effects upon the fractured limb. They have demonstrated that it is possible to preserve the function of the injured limb during the process of healing of its fractured bone without interfering with, indeed, promoting, that union.

In no field of surgery is greater experience and greater ingenuity required than in the treatment of fractures. Each case requires for its management a consideration of its own peculiarities, and the adoption of such treatment as will best meet its individual needs. There is no set rule adapted to all cases. It is as ridiculous to say that all fractures require operation as to say that none requires it. The successful management of a fracture requires a knowledge of many methods, and the selection of that one which in the individual case will lead to a restoration of the form and function of the injured limb in the shortest time possible, and with the least danger and inconvenience to the patient. It is not alone necessary that the form of the bone shall be restored as near as possible to the normal, it is necessary to accomplish this in such manner that the function of the limb may be restored, and with the least possible delay. We must remember that a fracture is an injury, not to a bone alone, but to a limb, and it is a mistake to concentrate our attention upon the bone in disregard of the soft parts. Only to a certain extent is it true that function depends upon anatomical restitution of the bone. It is a matter of common knowledge that perfect apposition of the fragments may be attained and yet the means employed for their retention may result in such damage to the soft parts and joints that function is never recovered.

The converse is equally true, that very faulty apposition may be compatible with perfect function, provided the integrity of the soft parts and joints is preserved. If, in order to secure accurate apposition, such means must be adopted as will endanger the integrity of the limb or impair the usefulness of its soft parts, we must desist from such measures and adopt such form of treatment as will conserve the function at the expense of some bony deformity.

The advent of the *x*-ray into the treatment of fractures has not been an unmixed blessing, for it has served so to fix attention upon the bone alone that the severity of the injury, and the result of treatment, are judged solely by the radiograph. The criterion of successful treatment is function and that cannot be displayed in the *x*-ray picture. No one would dare prognosticate the usefulness of an injured limb from an inspection of its radiograph alone. If the plane of the articular surface of the

bone is maintained in its normal relations, a perfect function may be secured even with an atrocious radiographic finding, and, in some joints, even this is not necessary, as witness the usefulness of many a wrist with gross deformity of the lower end of the radius.

I am far from decrying the desirability of securing a reasonable approximation of the fragments, but I am convinced that this should not be the sole object of treatment, nor should our success be judged solely by the degree of its accomplishment.

Not only should function be the main object of treatment, but that function should be restored in the shortest time possible. The time element has not been given the consideration which it deserves in the choice of our methods of treatment. The present tendency toward universal insurance of labor, growing out of our recently enacted employers' liability laws, obligates us to give greater heed to the element of time in the recovery from fractures. This is a matter of great economic importance, for, if but a few days can be saved from each fracture, by the selection of its form of treatment, the saving becomes in the aggregate an amount of enormous value.

The element of danger must enter into our consideration, from both a social and an economic standpoint, for, aside from the shock to our sensibilities occasioned by a death from the treatment of an injury, itself not dangerous to life, we must consider the enormous economic waste of a life cut off in its prime.

The element of convenience is a less important matter, but still worthy of consideration, for the alleviation of pain is an important function of the surgeon.

The length of disability occasioned by a fracture ordinarily consists of two elements, the time required for union of the bone, and the time required for restoration of the function of the soft parts. The union of the bone may be influenced by treatment insofar as close approximation favors early union, and increase of nourishment favors bone formation, but the greatest opportunity for the saving of time is offered in the restoration of the function of the soft parts. With our older belief in the necessity of firm immobilization of the fragments, for the formation and consolidation of callus, it was essential that restoration of function be delayed until union of the bone had occurred.

With the absolute overthrow of this belief has come the greatest advance in fracture treatment. If we can conserve the function of the limb during the healing of the fractured bone, we may shorten the process of repair enormously. If by our treatment we can hasten the repair of the bone, while maintaining the function of the injured limb, and, if we can accomplish this purpose with absolute relief of pain and without any danger to the life of our patient, we have reached the acme of fracture treatment.

In certain forms of fracture this ideal is reached by the method of Championniére.

The essential element of this treatment is mobilization, which is begun by active movements of the limb, immediately after the injury and continued until its complete recovery.

To render active movements possible it is necessary to make them painless, and this is accomplished by massage and passive movements.

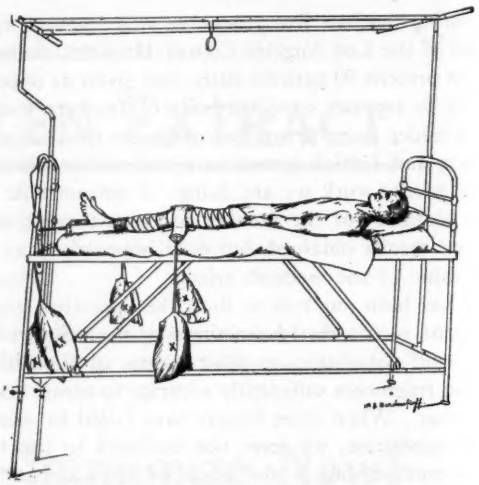

Fig. I.—Longitudinal and lateral pulls in fracture through the tuberosities of the tibia with lateral luxation of the knee.

It is possible by massage to so anesthetize a fractured limb that passive and then active movements may be commenced immediately after the injury. It is surprising to what extent this may be accomplished even in sensitive and nervous patients.

The greatest pain in a fractured limb is caused by the muscular contractions and the strain of holding the limb in a fixed position. Massage and passive movement relax the muscles and relieve the tension, and the patient finds, to his surprise, that active movements are possible, not only without pain, but with the greatest relief.

The massage which accomplishes this really astonishing result is not that used by the professional masseur, but is a very gentle stroking massage, so light at first as to be scarcely perceptible to the patient. So light and gentle must it be that no pain whatever is produced. Pain defeats the object of the massage, and is an indication that it is improperly used.

The patient must be so placed that he is perfectly comfortable, with the limb in the position of greatest ease. As a lubricant, I prefer talcum powder, but oils and ointments may be used, if preferred.

The movements must be slow and methodical, about 15 or 20 to the minute, and each stroke must follow the path of its predecessor, beginning at the distal end and stroking the length of the limb in the direction of the venous current or of the underlying muscles.

At first, the location of the fracture is to be avoided, but as anesthesia deepens, this region is to be included. Gradually and imperceptibly the pressure is increased until the weight of the hand is borne, but never is any deep pressure made in this phase of the treatment. Later, local deep massage may be necessary to hasten the absorption of edema or exudate, but that is of a different nature and for a different indication than the process we are now considering.

Monotonously the strokes are repeated, traversing an unvarying course for a period of 10 to 15 minutes, when a change is made to another surface of the limb for a like length of time. Usually only two surfaces are treated at a séance.

At the first treatment following the injury, at least 20 to 30 minutes should be employed for the massage. During this time note is taken of irregularities in the position of the fragments and points of greatest tenderness, and, usually, a fair diagnosis of the nature of the fracture may be made. As the limb becomes anesthetized and the muscles relaxed, crepitus may be noted, which is usually painless, and correction of position may be made without pain.

The next step in the treatment is passive movement, which must likewise be slow, gentle and methodical, but must include every joint in the extremity. It is of the greatest importance to secure relaxation and absence of resistance during these movements, and this is often the greatest difficulty we have to contend with.

There must be no force whatever used, and no pain produced. The movements must not exceed the rate of 10 to the minute, and must cease whenever resistance is felt. The amplitude of the movements must be very slight at first, increasing as resistance diminishes, but it is not necessary to move the joint through its complete range to avoid adhesion. Every variety of movement of which the joint is capable must be practiced. During these gentle movements reduction frequently takes place, the fragments falling into position as the muscles relax. During the later séances amplitude and direction of the movements must never be such as to cause gross displacement; but slight movement between the fragments is in no wise injurious, indeed, it rather favors union through the stimulus of callus formation.

Active movements now follow the passive, but again only of such extent as can be painlessly produced, and, later, such as will not cause displacement of the fragments.

It is surprising how freely the patient can make active movements after an efficient séance of massage and passive movement. He often must be restrained or cautioned against excess.

If reduction has not been sufficiently accomplished during the séance, it must now be obtained as far as possible, and it is frequently surprising how easily it may be accomplished by manipulations

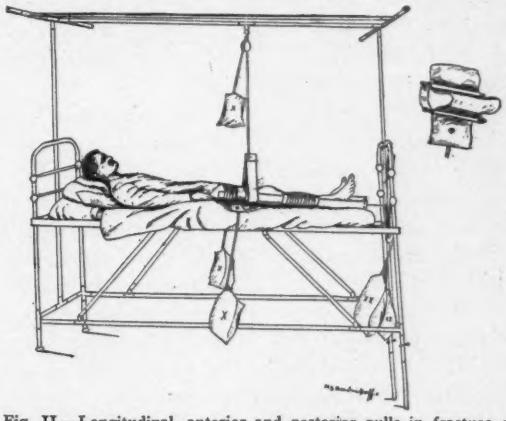

Fig. II.—Longitudinal, anterior and posterior pulls in fracture of the femur with posterior displacement of the lower fragment.

previously unavailing from muscular rigidity. If reduction cannot be obtained without pain, an anesthetic must be administered and the usual manipulations employed. Following reduction, the limb is again massaged and the necessary splints applied, but always in such manner that they may be readily moved for treatments.

Championniére has been accused of having adopted the "do nothing" treatment of fractures, and it is thought by many that he dispenses with all splints. Nothing could be farther from the truth. He uses, but does not abuse, splints.

If the fracture is of such nature that little tendency to reproduction of deformity exists, the splints are removed daily for mobilization, and the above sequence of treatment is maintained; massage followed by passive and then active movements, increasing daily in amplitude as union becomes more firm.

If splints serve no useful purpose of preventing displacement, they are dispensed with from the be-

ginning, and they are never worn longer than is necessary to guard against displacement.

If the fracture is of such nature that removal of the splints will allow displacement to occur, they are allowed to remain until such tendency has disappeared, or are removed in part sufficient for some massage and movement. A little is better than none, and gradually this may be increased as union progresses, but better is it that some displacement should occur than that the usefulness of the limb be endangered by prolonged immobilization.

As is readily appreciated, this method is particularly adapted to the treatment of such fractures as show little tendency to displacement after reduction, and fractures in which prolonged immobilization is productive of the most disastrous results. It is with such fractures that I would advise one to begin, but I feel assured that one will gradually increase the number of cases in which he finds it applicable as his confidence increases, and as its great advantages are impressed upon him.

We have found it of such advantage that it has taken precedence of all other methods in fractures of the forearm, especially of the Colles' variety, of the hand, wrist and elbow, of the clavicle, of the neck of the humerus, especially when impacted or without displacement, of the foot and ankle, especially Pott's fractures, and fractures of the malleoli.

In a few fractures of the neck of the femur, in which a prolonged stay in bed has seemed inadvisable, I have had the best of results, and in some tibia fractures it has been of advantage.

Always, it should play a part in every fracture at some stage of its treatment, even if of such a nature that its immediate and daily application seems inadvisable.

I cannot better emphasize the advantages of this method of treatment than by the report of a few illustrative cases taken from my private records.

Mrs. E., age 54. Fracture of Olecranon.

On January 9, 1912, she fell from a street car, striking upon the point of the left elbow. Referred by Dr. Evans on the following day, with a radiograph taken at a right angle, showing a fracture of the olecranon at its narrowest point, and a separation of the fragment of one inch at the posterior border of the ulna. The arm had been for 24 hours in a long posterior splint. The hand, forearm and elbow were considerably swollen, and the patient was in some pain. There was ecchymosis upon the inner side of the arm from the wrist to above the elbow. The elbow was distended, especially posteriorly. The fragment was evident, as a prominence above the normal point of the elbow, and the depression between the fragments could be easily felt.

The splint was removed and the extremity massaged for 20 minutes. Passive movements were given to the fingers, wrist and shoulder. The elbow was then slowly flexed and extended a few times, and gently brought to a right angle. An ordinary sling was applied, and the patient directed to use the hand as much as she could in the sling.

She returned every day to the office, and expressed great relief from the treatments.

At the expiration of a week, the swelling had disappeared. The fragment had descended until but a very slight groove could be felt at a right angle. The forearm could be passively extended almost completely, and flexed slightly beyond a right angle without the slightest pain. Active flexion was free to a right angle, but active extension was not permitted.

At the expiration of the second week, the sling was removed when at home, and she was permitted to use the arm for light work requiring no overhand movements.

At the end of the fifth week the elbow appeared normal. There seemed to be firm fibrous union of the fragment, with a separation which could be felt as a slight groove, but was not visible. There was free active movement at the elbow through about 120°. She could touch either ear, and get the hand easily to the mouth, back of the head and root of the neck on the opposite side.

At the end of the eighth week she was discharged. The elbow appeared normal in any position. At acute flexion a slight groove could be felt between the fragments, but no movement was appreciable. She could use the hand to button her collar in front and behind, and the finger tips could approach within two inches of the shoulder. The last 10° of extension was still lacking. She had no pain during movement, and used the arm freely.

I saw her again six months after the injury. She stated that the arm was as good as the uninjured one, and she could do with it any work she could before the injury. The finger tips came within one inch of the shoulder, and extension was almost, but not quite, complete. The olecranon felt slightly enlarged, and a very slight groove could be felt.

Mr. F., age 56. Colles' Fracture.

He was injured on December 5, 1912, by the kick back of his automobile crank handle. He was referred by Dr. Brainerd, under whose care he had been for neurasthenia.

I saw him within two hours of the injury. He was in great pain and would not allow the arm to be touched. There was moderate swelling, and slight, but typical, silver-fork deformity. Under ether, reduction was easily accomplished, with the disappearance of the deformity. A short anterior, and a long posterior straight board splint were applied.

The radiograph showed a transverse fracture across the lower end of the radius, about three-quarters of an inch above the lower end, with a vertical fissure extending into the joint. There was no deformity.

On the following day the splints were removed and massage and mobilization begun. The séances were continued daily for 17 days, then every second day for two weeks longer. At the expiration of one

week the swelling had disappeared, but there was still ecchymosis almost to the elbow, along the radial side of the forearm. He still had pain at night, but said if the séance was given at 5 P. M. the relief lasted until almost morning. Movement of the wrist and fingers was free in all directions. Supination was still somewhat restricted. He signed his name legibly, and did his five-finger-exercises freely. On the ninth day, the splints were left off and the arm carried in a sling. The posterior splint he applied at night for four or five days longer, through fear of injury. At the end of the fourth week the arm was practically well, with motion perfectly free in every respect.

This was a Colles' fracture of moderate severity, but, considering the man's age, 56, and the fact that he was a nervous, sensitive individual, the result was gratifying. In younger patients the relief is so early, and the arm returns so quickly to the normal, that care must be taken that they do not overdo when the splints are removed.

In Colles' fractures showing little tendency to return of the deformity, it is seldom necessary to wear the splints over a week or ten days, but in the cases in which there has been marked deformity, with a tendency to its reproduction upon early removal of the splints, they should be worn for two or three weeks, by the end of which time the union should be firm and motion perfectly free in every respect, including supination, which is the last to recover.

One of my internes, a young man, with a Colles' fracture of moderate severity of the right wrist, continued his duties in the hospital, writing histories, examining chests and the like. His splints were discarded after a week, and he used the hand freely. He played tennis at the end of the third week.

Mennell, of London, who has had much experience with this method, says: "It may be anticipated that full functional utility will be restored for domestic, clerical and other non-laborious purposes, such as the playing of musical instruments and typewriting, in four weeks, and occasionally in three; in six weeks for ordinary labor; in eight weeks for work of any kind." My limited experience bears out his statements.

Mr. I., age 18. Comminuted Fracture of the Left Clavicle.

Injured July 21, 1913, by a collision of his automobile and a street car. Referred by Dr. Blass on the fourth day, with a radiograph showing a comminuted fracture of the clavicle in its middle third, a fragment about one inch long lying obliquely between the main fragments. The arm had been bandaged to the side by adhesive plaster, and an attempt made to hold the shoulder elevated. The weather being warm the skin of the hand was macerated; there was eczema of the chest and axilla with a disagreeable odor.

The deformity was marked, with the usual elevation of the outer end of the inner fragment. Crepitus was free, but the deformity was not appreciably reduced by elevating and drawing backward the shoulder.

I advised bed treatment, with Bardenheuer extension, or open operation. He would not consent to either, but readily agreed to be satisfied with the deformity, which I explained would follow the massage treatment.

All restraint was removed, and, after a séance of massage and mobilization, the arm was hung in an ordinary sling, attempting some upward pressure on the elbow.

He returned daily for treatment. The deformity diminished considerably, as each day the fragments were pressed into position with free crepitus. After the second séance there was no pain and he used the forearm freely in the sling. At the end of a week the sling was removed and he was permitted

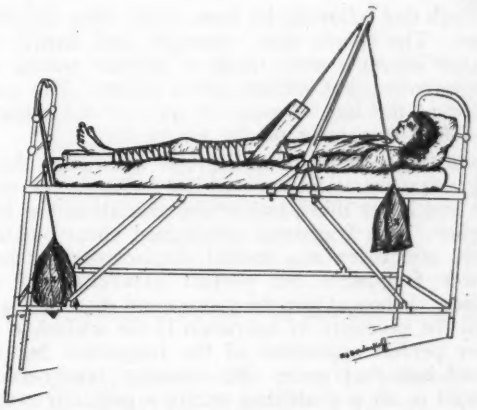

Fig. III.—Longitudinal and lateral pulls in fracture of the neck of the femur.

to put on his shirt and coat, and use the arm, warning against overhand movements.

The crepitus persisted for three weeks, but he used the arm freely notwithstanding, as it caused him no pain. On the 28th day after his injury he went into the plunge and surf, and swam a few yards. On the 34th day he swam 150 yards, with the overhand or crawl stroke, and I discharged him. Deformity was present, but of distinctly less degree than when I first saw him, and no greater than I have had following treatment in the Sayre's dressing, even in fractures of less severity.

In clavicle fractures with little or no deformity this treatment has been ideal, and, after the first week, function has been practically restored with so little inconvenience that the patient scarcely realizes he has had a fracture. Where even slight deformity is to be avoided, it may be advisable to keep the patient on her back in bed for the first week or ten days, carrying out the treatment in that position, but in men, to whom some deformity is not objectionable, the sling answers every purpose. When

marked elevation of the inner fragment is present, adhesive plaster, applied after the method of Hood, may be advisable, and in no way interferes with the massage or movements.

Mr. P., age 56. Fracture of Both Bones of the Right Forearm.

Injured February 17, 1914, by having his arm caught in a machine belt. Referred by Dr. Martin, on the same day, as a case requiring operation, since he was unable to maintain reduction.

I saw him a few hours after the injury. It was impossible to accurately palpate the fracture because of the swelling and heavy musculature but there was evident a fracture of both bones about in the middle third, with overlapping and lateral displacement.

The limb was massaged for half an hour, and placed in anterior short, and posterior long splints. There was complete relief from pain from the massage.

Each day following he came to the office for massage. The splints were removed and during the séance attempts were made to further reduce the displacement but without much success. He marveled at the lack of pain, in spite of the crepitus and free movement of the fragments.

On the sixth day a radiograph was taken, showing a transverse fracture of the radius at the middle and lower third, and of the ulna about one inch higher. The fragments overlapped about one-half inch, and there was medial displacement of both lower fragments but perfect parallelism of the bones. I showed him the picture and discussed with him the necessity of operation if we wished to secure perfect apposition of the fragments but advised him that under the massage treatment he would in all probabilities secure a perfectly strong and functionating arm. He left the decision to me, and I continued the daily séances.

At the end of the fourth week, there was firm bony union, and the splints were left off. There was no apparent deformity, save a small lump over the radial fracture. Motion of the wrist and elbow was perfectly free, but a tight fist could not be made, and supination was slightly limited. He carried the arm in a sling, except when exercising, for five days longer, when he put on his coat and used the hand in eating.

By the expiration of the eighth week, the arm was well, with all movements practically perfect. The grip was still weak, but he made a tight fist, and used the hand in kneading his clay.

This is an example of atrocious *x*-ray appearance, and of perfect cosmetic and functional restoration.

Mrs. B., age 75. Intertrochanteric Fracture of the Neck of the Femur, with separation of the trochanter minor. Probable impaction.

She fell from her couch, November 25, 1913, striking upon the trochanter. I saw her shortly after the accident.

A frail, small woman. The right lower extremity lay helpless in outward rotation, with shortening of about one inch. The slightest movement caused intense pain and muscular contractions.

I discussed with her daughter, who is a physician, the inadvisability of any treatment which would confine her mother long in bed, and advised the massage treatment. An intelligent nurse was secured and instructed in the technic. Sand bags were placed along the limb for a few days, and then discarded. By the third day all painful contractures had ceased, and she had no further pain.

After the fifteenth day she was placed daily in a chair. About the eighth week she could raise the heel from the bed, and all movements of the knee and hip were quite free and painless. In the fifth week she essayed crutches, but without much success, although it caused no pain.

I did not see her again until about four months after the injury, when she was walking about with the aid of one crutch; she walked a few steps without any support, bearing full weight upon the injured limb without pain. All movements were free and painless, but the limb was still weak and she was afraid. Union seemed firm, and there was no deformity, save about one inch of shortening.

Considering the age, 75, and that the treatment was accompanied with so little inconvenience, the result seems very gratifying.

In a number of fractures of the elbow in children, the results have been very pleasing. The children enjoy the treatments, and union with restoration of function is so rapid that these injuries are robbed of their terrors, for both the patient and surgeon.

The technic of this treatment is simple, but exact, and it is only fair that it should be followed accurately, as the master has outlined it, before judgment is rendered. Half-heartedness will yield results short of the best, and unskilful, rough massage and movements will defeat the object.

It should not be attempted without careful perusal of Championniére's little book, "Prècis du Traitement des Fractures par le Massage et la Mobilisation," or still better, of the work of his ardent disciple Mennell, "The Treatment of Fractures by Mobilisation and Massage," published by MacMillan & Co., 1911.

The second method of fracture treatment to which I would call attention is the one with which we have had the most experience in our hospital work, as it is adapted chiefly to those forms of fracture necessitating bed treatment.

The method of Bardenheuer consists of the application of permanent extension, by the use of adhesive plaster and weights, and is but an elaboration of the well-known Buck's extension, but so extended and improved in its details as to constitute a well defined system of treatment.

In Professor Bardenheuer's clinic in Cologne, the method is used exclusively for all fractures of the extremities, and its detail is the result of over 25 years of experience in many thousands of cases.

No splints whatever are used. The reduction of the fragments is maintained by the extension alone, for, in addition to the longitudinal pull, lateral, anterior and posterior pulls are applied as indicated by the nature of the displacement. As in most fractures of the extremities the persistent displacement is due, in great part, to the retraction of the muscles, the logical means of overcoming these forces is by forces likewise acting continuously but in the opposite direction. We have long recognized that the most rational method of overcoming longitudinal displacement, in the sense of shortening, is by longitudinal traction, but it remained for Bardenheuer to show us that lateral displacements could be overcome in like manner. The advantages of the method are not exhausted with the better reduction and retention of the fragments; the permanent extension also prevents retraction of all of the soft parts, preserving their elasticity and avoiding the troublesome stiffness of the muscles and the joint adhesions which so long delay convalescence after fractures.

The method permits early active movement, avoiding the muscular atrophy and circulatory disturbance which so frequently prevent use of the limb, long after the bone has become united. Absolute immobilization of the fracture is not obtained nor striven for, but accurate adjustment of the fragments is one of the main objects of the method.

The success of Bardenheuer's method is wholly dependent upon the detail of its application, and it is for this reason that its use has not been more rapidly adopted, for the technic seems, from description alone, very intricate and complicated. In practice, however, it is very simple, and it can be applied by anyone who has ordinary mechanical ability, after he has acquired a few of the essential details.

As it is impossible here to describe the application of the method to the various fractures, a description of some common forms will suffice to show the chief points of technic.

Let us illustrate with a typical fracture of the middle third of the femur.

A strong, firm bed must be selected, with an even, hard mattress, as the limb rests upon the bed without the intervention of splints of any kind. The longitudinal extension is first applied, as in the application of Buck's extension, but with a few important variations from the usual technic, which are essential because of the heavy weights used.

The plaster employed must be of strong material; we use the Z-O adhesive on moleskin. This comes in one- and five-yard rolls, 7 inches wide, which, torn lengthwise, makes the required width. The length must be sufficient to reach in every case, regardless of the location of the fracture, from the groin upon the inner side, around the sole of the foot to the trochanter major upon the outer side, and should preferably be of one piece. If, from reasons of economy, the yard length is used, the lower end must be securely tacked to the foot-board or spreader. The 3½-inch width being too wide for most ankles, the plaster should be tapered in its lower third to fit the leg. The foot-board or spreader should be but slightly wider than the ankle at the malleoli. If too wide, it spreads the plaster too much, drawing it away from the leg. If too

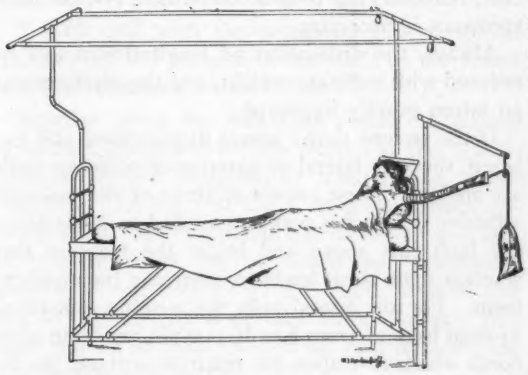

Fig. IV.—Extension in fracture in the neighborhood of the shoulder joint.

narrow, the plaster presses upon the malleoli. It should be placed close to the sole of the foot. After properly shaping the plaster, the face-cloth which protects the adhesive surface should be removed, but not from its entire length, for it is desirable that it should not adhere at the knee, nor from just above the malleoli to the spreader.

Under an anesthetic, if necessary, reduction is accomplished, and, while maintaining strong traction upon the foot, the plaster is applied smoothly to the unshaved limb. The longitudinal strips are now held securely in place by circular strips of ordinary Z-O adhesive, 2 inches wide, beginning a short distance above the malleoli, and reaching to just below the knee, each strip overlapping slightly the one below. The knee is left bare. Then, beginning a short distance above the knee, the circulars are applied in like manner up to the groin. This encases the entire limb, excepting the foot and knee, in a mantle of adhesive plaster. To the rope attached to the foot-board are hung weights, preferably sand bags, weighing 5 and 10 pounds each, sufficient to aggregate from 35 to 50 pounds in the adult, depending upon the size and muscular de-

velopment, but always sufficient to overcome the shortening. With the adhesive applied as described, these weights are borne without great discomfort.

The bed, deprived of springs, should be elevated at its foot from one-and-a-half to two feet, or sufficient to balance the patient and his weights. Under the knee a folded sheet should be placed to prevent hyperextension, which causes severe pain.

No splints whatever are applied, and no sand bags nor other appliances. The limb is now straight to the eye, and, as a rule, has no tendency to eversion. It is our custom to wait for 24 hours before having a radiograph taken, in order that the extension may exert its full influence upon the contracted muscles. In many cases it will be found that sufficient reduction has been accomplished, and no other appliance is necessary.

Always, the dislocation ad longitudinam can be reduced with sufficient weight, and the displacement ad latum greatly improved.

If the picture shows lateral displacement still existent, then the lateral or anterior or posterior pulls are applied. These consist of strips of the moleskin adhesive 3½ inches wide, so applied as loops about the limb just above and below the fracture that traction upon them tends to overcome the displacement. For the lateral pulls the weights, consisting of sand bags of from 5 to 10 pounds, are hung upon cords which rest upon the mattress without the intervention of pulleys. The rope for the anterior pull passes through a pulley in the ceiling or upon a frame over the bed.

The posterior pull is applied by a device consisting of two parallel rollers connected by strap iron bands passing beneath the limb. The adhesive strip, with its cloth protection unremoved, passes under one roller, then over the limb and under the other roller. To each end a cord and weight are attached, hanging over the side of the bed. Thus backward traction is made upon the fragment.

Rotary pulls can be applied by proper application of the adhesive strips and suitable direction of the extending force. With a little ingenuity, the forces may be so applied that the tendency to displacement in any direction can be overcome. The force may be increased or diminished, or its direction changed, according to the indication as shown by the eye or touch, or by the radiograph, and always the limb is under direct inspection unobscured by splints or bandages.

The discomfort to the patient is slight after the first few days, if proper attention is paid to the points of possible pressure.

Properly applied, the first adhesive plaster will last throughout the 5 or 6 weeks of extension necessary for the union of the fracture, and when it is removed, the skin will be found with but few abrasions.

As soon as sufficient union has taken place, usually during the fourth week, movements of the hip and knee are begun, at first passive and then active. The side weights are removed and the longitudinal pull lightened during these exercises, which should be given twice daily. In the intervals the weights are reattached. Extension should be maintained from five to six weeks, or until firm union has taken place, when the adhesive plaster is removed.

For the following two weeks the patient remains in bed with massage and exercises twice daily, when he may be allowed up on crutches, but no weight should be borne upon the injured limb for two or three weeks longer, depending upon the nature of the union.

In femur shaft fractures, Bardenheuer's method has become our choice, and, save for the occasional use of the Hodgen's splint, no other method is used. Union has invariably been secured, and with a result, both cosmetic and functional, that is very gratifying.

Our femur neck fractures are treated by the same method of longitudinal extension, with the addition of a lateral pull at the upper third of the thigh which, by diminishing the inter-fragmentary pressure, prevents absorption of the neck. Contrary to the usual view, we have found these old patients to stand remarkably well the confinement to bed, and our mortality has been very low.

In fractures of the leg bones the adhesive straps are placed in exactly the same manner, but reaching only to the middle of the thigh, and in low fractures additional straps are placed about the ankle, exerting their force upon the foot.

In leg injuries we have found this method of great advantage, in comminuted fractures, and those difficult to retain in plaster of Paris, but especially in fractures involving the joints, as the freedom of movement prevents the annoying joint stiffness.

Fractures of the upper extremity which cannot be retained satisfactorily by the usual methods may require permanent extension, and the method is here quite as easy of application as in the lower extremity.

It is especially in fractures of the surgical neck of the humerus that we have learned to prize the method of Bardenheuer, as we have been able to secure results unequaled by any other method. In these fractures the typical displacement is an abduction of the short upper fragment by the muscles attached to the greater tuberosity with abduction

of the lower fragment by the pectorals and latissimus. As it is quite impossible in these cases to control the short upper fragment by splints of any kind, it is rational to place the lower fragment in line with it. This is best accomplished by permanent extension with the arm abducted to the horizontal, or even to the perpendicular, in line with the long axis of the body, the patient lying upon a back rest. The adhesive strips are applied to the flexor and extensor surfaces of the forearm and arm, but do not adhere to the hand nor elbow. A longitudinal pull of about 12 pounds is applied with lateral pulls near the shoulder, if necessary. After about the eighth or tenth day, active movement is begun; the weights being lightened and the patient instructed to pull up the weights with gradually increasing excursions. After the third week the weights are removed by day and exercise with a staff is begun, the weights being reapplied at night for a week longer. In this manner atrophy and retraction of the muscles are prevented, complete elevation of the arm is assured, and the usual long period of disability is prevented.

We have secured in a number of patients beyond 60 years of age complete restoration of function in a remarkably short period of time. One woman in particular, past 60, with a loose fracture of the surgical neck of the humerus, and a fracture of the olecranon upon the same side, had complete restoration of movement and strength within three months of her injury, and, in the majority of our cases, active elevation of the arm to the perpendicular is possible within six weeks of the injury.

This same method is applicable to fractures of the clavicle, of the neck of the scapula, and for the after-treatment of shoulder luxations and resections of the head of the humerus. Elbow fractures, if not satisfactorily retained by splints or hyperflexion, may frequently be held by permanent extension, and the early movement which it allows assures early restoration of function.

As the method requires retention in bed, and close attention upon the part of the internes and nurses, we have limited its application to those cases in which simpler methods of treatment have not been satisfactory.

As our experience with Bardenheuer's method has increased, we have come to value it more and more in the treatment of those cases most difficult of retention. At the least, it is a most valuable adjunct to the mechanics of fracture treatment, and I am confident it will gain in favor in America, as it has in Germany, when its application becomes more familiar.

A full description of the principles and detail of this method is contained in the little book by Bardenheuer and Graessner, entitled "Die Technik der Extensionsverbände," published by Ferdinand Enke of Stuttgart.

THE TREATMENT OF FRACTURES OF THE FEMUR WITH HODGEN'S SPLINT: INCLUDING A BIOGRAPHICAL NOTE ON ITS INVENTOR.

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I shall deal with the prognosis and results of fractures of the hip and of the shaft of the femur and their methods of treatment.

Scudder gives the following results in sixteen cases of fractures of the hip treated at the Massachusetts General Hospital, by traction and immobilization. Thirteen of the sixteen cases have impairment of the functional usefulness of the leg: all movement at the hip somewhat restricted; atrophy of the muscles of the thigh, buttock and calf of the leg and a decided limp. In only two cases out of sixteen could it be said that the leg was functionally useful.

Walker reports 112 cases of fractures of the hip: 18 died; 32 have not been found; 22 show improvement; 30 are unable to work because of persistent pain, and restriction of movement at the hip and on account of shortening and abduction.

Stimson and Hitzrot say: Prognosis even as regards life is far from cheering. The aged and feeble patient is liable to pass into a cachectic or demented state and thus to fade away.

Cotton gives a mortality of 25 per cent. for hip fractures.

We should think of the patient rather than the fracture. The majority are old people and they are apt to die from confinement to bed.

Scudder outlines the treatment of hip fracture under four heads: First, traction and counter-traction. This is nothing more than the old-time Buck's extension, which is responsible for so many bad results.

Second, the Thomas hip splint. This requires a great deal of skill in its proper application.

Third, forcible abduction with immobilization by plaster of Paris (Whitman method). This is a very popular method, and while it is good in so far as union is covered, it is not without certain drawbacks or objections. In applying this method it is

necessary to use an anesthetic, which we would all wish to avoid in the aged, among whom this accident is very common. Again, it is impossible to apply a plaster cast without having some degree of atrophy and wasting of the muscles and also stiffening of the knee-joint, which is a common complaint in cases treated by this method.

The fourth method is that of pegging. This is an ideal operative treatment, but it involves an operation and surgical risk.

In looking over the literature of fracture of the shaft, I see that the majority of men believe one inch shortening should be expected. In one of our large cities they were able to obtain the end-results in 242 patients, who had been treated in the different hospitals of that city for fracture of the shaft of the femur, and the results were as following: The average time in bed and with crutches,

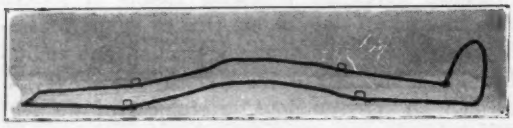

Fig. 1.

eight months; in adults at the time of discharge there was stiffness of the knee in 100 per cent. of cases; among adult laboring men 90 per cent. never become able to perform their regular occupations; and the shortening was from one to one and one-half inches in the majority of cases and in many of them there was over two inches.

There are still a few surgeons who believe in the open method for all fractures of the shaft. I must say I cannot agree with them, for 85 to 90 per cent. of long bones fractures can be successfully treated by the closed method. With the open method, the slight improvement in position of the fragments that is obtained does not compensate for the additional injury to the soft parts by the operation.

The Hodgen's splint is applicable to any part of the femoral neck and to the shaft. We use it in all cases except the very young, also whenever we graft, plate or peg and in compound fractures of the femur. A piece can be cut out or unpinned opposite the wound and a dressing can be applied without disturbing the fracture.

It affords great comfort, requires little time to adjust, requires no elaborate apparatus, involves no danger of pressure injury, overcomes all displacing tendencies of muscular action, requires no anesthetic and from the beginning the patient may be allowed to sit up in bed with a back-rest to eat, read, write and use the bed pan. All this can be done without fear of displacing the fragments, for when the body is moved the limb in the splint moves as a whole from the hip-joint. Also one can thus treat the patient nearly as well in his residence as at the hospital and without a fracture bed.

It is the original Hodgen splint and not the Brown modification, which we see pictured in text-books, to which I refer.

Any blacksmith can make the splint in a few minutes, if given the dimensions. The material is one piece of 3/16 inch brass or iron or #4 wire. The distal is six inches wide and the proximal

Fig. 2.

eight inches, and this end is closed by an arch to pass over the thigh. The length of the splint is 36 inches. On the top of the frame four small loops are placed, two on each side, one pair nine inches from the proximal end, and one pair ten inches from the distal end (figure 1). These loops are for the supporting cords or straps. Twelve inches from the proximal end the splint is bent to an angle of about 170 degrees. This will allow the limb to become partially flexed. Four school straps or cords equipped with tent blocks are passed through the supporting loops on the splint and are passed through an iron ring about 12 to 14 inches above the frame. A sash cord is attached to the ring which is swung from the ceiling just below the end of the bed or some support not connected with the bed (figure 2).

A piece of domestic or light canvas placed over the splint to form a hammock in which the limb may rest is pinned on either side with safety pins. The limb is prepared the same as for the application of a Buck's extension with the two or two and one-half inch adhesive plaster. The plaster extends about eight inches beyond the heel on each

side and the ends of these are attached to the distal end of the splint or the adhesive. Short pieces of bandage can be attached to the free end. This will supply traction when the splint is in place. The splint is applied by making traction on the limb—it is slipped on the limb, the loop over the thigh, passing well up to the perineum. Then the adhesive plaster or bandage is tied to the cross piece at the end of the splint.

Fig. 3.

Elevation of the bed will afford counter-traction. The splint containing the limb is now suspended on the sash cord hanging from the ceiling. The leg (that is, from the knee) should be from four to six inches above the bed and parallel with the bed. A pair of scales should be placed between the rope and the ring for measuring the amount of traction, first weighing the limb and then moving the bed away from the point of suspension until an additional fifteen or twenty pounds register. The eversion is corrected by adjusting the straps or tent blocks. The bed is pushed to one side so as to abduct the limb, depending upon whether the fracture is high or low on the femur. The splint should always be suspended. Rest on a pillow will defeat every object.

We have treated thirty cases by this method. Twelve were fractures of the neck and eighteen fractures of the shaft. The ages ranged from eleven to seventy-four. There were three deaths: two fractures of the neck of the femur—one from pneumonia and the other from exhaustion; and the third, a shaft fracture, from infection (streptococcus). We do not believe these deaths can be attributed to the treatment used.

Four of the twelve cases of fracture of the femoral neck had no shortening and the remaining averaged half an inch; only one of the cases had more shortening, and this one had one inch.

Of the eighteen shaft fractures one had a bilateral fracture, and his left limb had a half-inch shorten-

Fig. 4.

ing. This patient was a lineman and reported to his same position in four months. In the majority of the shaft cases there was no shortening, but eight of these ranged from one-fourth to three-fourths of an inch (four one-fourth, two one-third, and two three-fourths). In all the above cases except one the functional results were good.

Figure 3 shows a compound comminuted fracture of the middle third of the femur which was caused by a pistol ball. I was called in several days after the accident and found the limb with two and one-half inches shortening and a drainage tube passing through the wound (anterior-posteriorly). There was temperature of 102° F. We removed the tube and iodined the wound well. The limb was put in a Hodgen splint and placed in abduction. After putting the limb up we had another picture taken (figure 4), which shows it was in good position. The wound drained about two weeks, an opening having been cut in the canvas for the purpose. Due to the complications (infected wound), we allowed the limb to remain up for nearly ten weeks. He has absolutely perfect function of the limb. He has only one-fourth of

an inch shortening. In my opinion, this method is far superior to any other.

This splint was invented by John Thompson Hodgen, who was born in La Rue County, Kentucky, January 19, 1826. In his twentieth year he entered the Medical Department of the University of the State of Missouri, from which he was graduated in 1848, and later he filled both chairs of anatomy and physiology. When the Missouri College building was seized by the Government during the war, Hodgen transferred his allegiance to the St. Louis Medical College, where he filled the chairs of anatomy and physiology. In 1875 he assumed the chair of surgical anatomy of fractures and dislocations and was created dean of the faculty, which position he held at the time of his death. For eighteen years he taught clinical surgery at the City Hospital. During the Civil War he served as surgeon-general of the Western Sanitary Commission, 1861; surgeon, United States Volunteers, 1861 to 1864; and surgeon-general, State of Missouri, 1862 to 1864. He served as consulting surgeon to the City Hospital from 1862 to 1882, and was president of the St. Louis Board of Health from 1867 to 1868. He was president of the St. Louis Medical Society in 1872 and was chairman of the surgical section of the American Medical Association in 1876 and president of the American Medical Association in 1880. He was a powerful debater, and in the International Medical Congress in 1876 at Philadelphia, he won substantial honors that stamped him as a great man in the midst of the greatest the civilized world could produce.

He possessed decided mechanical genius, his inventions most worthy of note being a wire splint for fracture of the thigh; suspension cord and pulleys, permitting flexion, extension and rotation in fracture of the leg; a forceps dilator for removal of foreign bodies from air passages without tracheotomy; wire suspension splint for injury of the arm; double action syringe and stomach pump; and a hair-pin dilator for separating lips of the opening in the trachea, and as a guide to the tracheal tube.

He died in his fifty-seventh year of acute peritonitis, caused by ulceration of the gall-bladder, after a short and painful illness.

He loved his profession, was quick to cheer and help the meritorious and struggling young student and practitioner, and of a free and open nature. He was easy and familiar with younger colleagues, rejoiced in their emoluments, success, and honors, and gave them full meed of praise when merited, and never sought to monopolize the honors of his calling.

A man in the fullest and highest sense of the word, ever true to his convictions of right, loyal to his friends, tender in sickness and sorrow, wise and cultured from extensive and thoughtful reading, but much more so from direct and constant insight into the human frame in health and disease, the memory of John T. Hodgen will long be cherished as an enduring honor to St. Louis and to the profession which he ornamented.

COLLES' FRACTURE.

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In no other branch of surgery are mistakes in diagnosis and treatment more frequently made than in Colles' fracture; nowhere are results of inaccurate diagnosis and ill-advised treatment more deplorable. The truth of this has so frequently been impressed upon me during my nine years of practice that I have reason to feel the profession cannot be too often reminded of its duty.

Fractures of the radius take first place in frequency among all fractures, according to a number of eminent writers; and this I find in my own observation to be true. This is a long-studied and exceedingly frequent fracture, and presumably so well understood that it will be difficult to present anything particularly new, with the exception of two or three points in connection with the treatment. However, it does seem evident that an attempt at this subject is not amiss when we are forced to recall many cases in which there has been a failure to recognize or to properly treat.

A transverse fracture of the lower end of the radius ranging from ½ to ¾ of an inch above the lower end is the typical Colles' fracture, as described by him in 1814, but, clinically speaking, the term "Colles' fracture" is broadly used to mean any fracture or combination of fractures within an inch and a half of the lower end of the radius. These fractures may be comminuted, transverse, oblique, complicated, and sometimes compound, which present a very different picture from the initial simple Colles', and according to my observation will embrace from fifty to sixty per cent. of the fractures of the lower end of the radius.

The clinical symptoms may be more readily appreciated if the mechanism of the injury is considered. The forces concerned in fracture of the radius are as follows: Falling upon the palm of the extended hand, the force exerted by the counteraction of the ground against that part of the weight of the body thrown upon the wrist is transmitted to

the carpus, which in turn as a solid unyielding mass, made so by its ligaments, transmits this force undiminished to the radius. Resistance of the ground, part of the body weight, velocity of the falling motion, are the components of this first force. Simultaneously the firm anterior ligament is put on the stretch, which, after exhaustion of its physiological elasticity, opposes the first force specified by pulling upon the radius. It is more resistant than the bone, thus the latter breaks more easily than the ligament tears. The lower end of the radius is therefore broken by pressure and by traction. The exclusive action of a blow or a tear is usually out of the question, considering mechanically that both forces must act to produce the fracture. The velocity of falling is accordingly of great importance in determining the site at which the force is transmitted. Therefore the point of fracture can be determined by the application of force. That the fracture can result at the distal end of the radius and not at its middle is explained purely by mechanical laws, the analysis of which is beyond the scope of this paper.

Fig. 1. Colles' fracture—first step in reduction.

The diagnosis of Colles' fracture in most cases is comparatively easy. However, in other or more atypical cases it would tax the ingenuity of an expert without the aid of the *x*-ray. The history of the force upon the surface of the palm of the outstretched hand; a backward and outward discoloration, or silver fork deformity; the styloid process of the ulna very pronounced and more anterior than that of the radius; the wrinkles in the skin of the palmar wrist surfaces more pronounced and deep; crepitation and abnormal mobility; the sudden offset and tense palmar ligaments; evidence of extreme pain on palpation over the head of the radius; discoloration or ecchymosis—these are the most important diagnostic points. In the picture just drawn, theer can be no excuse in not properly diagnosing Colles' fracture. On the other hand, in impacted or comminuted fracture,, where there is absence of intelligent history, of deformity, of abnormal mobility, and of the other prominent signs just mentioned, it may be very difficult to make the diagnosis. However, there are two leading symptoms, which I consider pathognomonic; one appears soon after the injury, the other may not appear until the third day. First, there is always extreme tenderness over the line of fracture; by grasping the forearm with your left hand, and the hand with your right, then making quick and firm pressure in line with the radius, if there is a fracture, excruciating pain will be elicited, otherwise, not. The second is the ecchymosis, which occurs in not only Colles' but in all fractures; the character of the ecchymosis is significant in this respect, that it rarely occurs for some hours after the injury, and as a rule at some distance from the site of the injury and is deep, not superficial like the ecchymosis from a contusion or bad sprain.

Fig. 2. Second step in reduction.

After the diagnosis comes the important question: What to do, how, and when? In no department of surgery is more all-around knowledge, good sense, and skill required than in the treatment of fractures. In my opinion it requires a more skilful surgeon to properly diagnose, reduce, and care for the average fracture than it does to perform the average abdominal operation. In no other phase of surgery are failures so frequent or so apparent to the layman. A badly reduced fracture is an opportunity for a malpractice suit, and most emphatically it is a living advertisement for the surgeon who fails to properly reduce it.

Some of the important causative factors contributing to imperfect function and deformity, not only in Colles' fracture, but all others exclusive of disease, are: First, failure to diagnose; second, the impossibility or failure to properly reduce the fracture; third, the improper appliances used; fourth,

and one of the most important, the improper after-treatment; fifth, the unwillingness of the patient to conform to advice.

There is scarcely any excuse to offer in failure to properly diagnose a Colles' fracture at this day and age, with all the modern and scientific methods at hand. We may sometimes fail to diagnose a fracture by the clinical manifestations, but whenever there exists any doubt, we should use the *x*-ray or treat the condition as a fracture, although it may not be. I shall not discuss the clinical symptoms,

Fig. 3. Anterior and posterior splints applied—to be used for the first eight days of treatment.

Fig. 4. Antero-posterior view of these splints applied.

the majority of these having been previously mentioned.

To reduce a Colles' fracture there are almost as many methods as there are individual operators, and it seems to be merely a matter of individual choice as to the method to employ. It is erroneous, therefore, to say that you should grasp the hand in any specified manner; yet, there are some essential points that I believe should be borne in mind in order to obtain the best results with the least trauma. First, never manipulate the fractured member more than is absolutely necessary to make a diagnosis, until you are ready to reduce the fracture and to apply the splints; for the least amount of manipulation produces the least amount of exudation, and the least amount of exudate produces the least amount of callus. Second, in reducing a fracture, have your assistant hold the forearm steady, while you grasp the wrist with one hand, holding the thumb in the dorsal surface over the distal portion of the bone, and the middle finger on the palmar surface of the same bone; hold firm the wrist and the head of the radius, taking care not to make too much pressure; while with the right hand grasp the patient's hand so that the palmar surface of your hand and that of the patient's are in contact, with the thumb and index finger around the patient's thumb, and with the wrist between the index and midder finger. In this manner you are enabled to get a firm grasp. Holding the wrist firm with the left hand, make hyper-extension with traction until the fragments are unlocked, then with thumb of the left hand guide the head of the radius, and with traction and slight rotation flex the hand until the head of the radius slips into position.

If it is a typical transverse Colles' fracture, you will have very little if any trouble holding it in position; but if it is comminuted, you must manipulate to adjust the fragments while the hand is held in position, and this position must be maintained while applying the splints, otherwise it will not remain reduced.

The oblique Colles' fracture with a long fragment in the interosseous space is one of the most difficult to handle without marked deformity and without greatly interfering with pronation and su-

pination. In this condition, make lateral pressure in conjunction with other methods, and this position must be maintained until the splints are applied.

I regard the kind of splints used as an important factor in the prevention of deformity and ankylosis. We know that by motion at the site of fracture, or by the movement of tendons gliding over the field of fracture, we produce an exudation of fluid and possibly blood under the periosteum; and if the periosteum is broken, as it usually is, then the exudate is not confined to the site of fracture, but involves the tendons and the surrounding structures of the joint. If the passive motion of the tendons is continued, extravasation of the fluid continues into these structures; and the greater the extravasation of fluid, the greater the callus formation; and the greater the callus formation, the greater the deformity; and the greater the deformity, the less function.

I consider that there is more stiffening of the fingers and wrist by the deposit of calcareous material in the tendons than by the deposit on the bone. To prevent this we must immobilize not only the wrist but the fingers for at least eight or ten days; by this time there is little danger of producing sanguineous exudation into the soft structures by movement of the tendons. As soon as this point in the treatment is passed, then passive motion is indicated. To prevent this extravasation of fluid and stiffening, use anterior and posterior splints from the elbow to the finger tips, cut to fit the arm, exercising care to have them wide enough to avoid lateral pressure with the bandage excepting where lateral pressure is indicated, as in oblique Colles' fracture; have the splints equally padded and apply them in the wedge shape, taking the precaution that the outer and inner edges are equi-distant, and that the splints fit snugly but not sufficiently tight to interfere with the circulation. Let the arm hang free, unless there is some special reason why this should not be done, for an arm carried in a sling invariably presents the bayonet deformity or an outward displacement of the lower fragment, due to the sagging of the arm in the sling—a condition I have been able to avoid by allowing the arm to hang free.

There are other methods in use by many operators, such as splints for flexion and extension, etc. It does seem to me that dressing the hand either in flexion or extension would produce either extension or relaxation of the flexor or extensor tendons, thereby causing the head of the radius to be tilted in whatever direction the hand is placed, and if retained in that position for a few days the deformity becomes permanent. Some use straight, short splints, permitting the fingers to be used, with special padding on the palmar surface of the forearm at the wrist, in order to make the arm conform to the splint, instead of making the splint conform to the natural contour of the hand and arm. This method often produces the silver fork deformity, instead of preventing it. All these methods I have used, and like all others who have had much to do with fractures, have been disappointed in a number of cases.

I have had a great many Colles' fractures come under my care, and for the last six years I have used

Fig. 5. Position of arm, without use of a sling. This prevents the occurrence of a bayonet-shaped deformity.

the straight splints, allowing the arm to hang free (except in the case of an oblique fracture with the long fragment in the interosseous space), and with the exception of one of two cases have had perfect function and from outward appearances no deformity. This does not mean that the bone is always in perfect apposition when shown under the *x*-ray, neither does it mean that the arm is as good as it was before the fracture occurred, for that is impossible; but it does mean that the function and shape of the arm are as nearly normal as possible.

I like the straight splints with marked adduction in the oblique fracture, for the reason that the head of the radius is thus drawn toward the ulna and the long fragment is thus thrown backward into apposition, and is so held until union takes place.

The after-treatment, for at least eight or ten days, is the same as the first, except inspection and instruction to the patient to cut the bandage at any time it should become too tight, in the event he cannot reach his physician. It is preferable to take the risk of having to reset the arm than to have a myositis with its following contractions, and this condition will manifest itself within the first twenty-four to thirty-six hours. Otherwise, in the after-treat-

ment, the splints should remain as applied without interference, unless swelling or other pressure symptoms arise to necessitate changing.

After the first ten days remove the splints, and make slight movement, which should be repeated at intervals of two or three days. Leave the anterior splint off, and use only the one dorsal splint. The anterior splint should never be used excepting in conjunction with the dorsal, as it will not only fail to correct a deformity, but will produce one in an otherwise perfectly reduced fracture. Keep the dorsal splints on, as an average, in the case of a young person, about three weeks; in the case of an

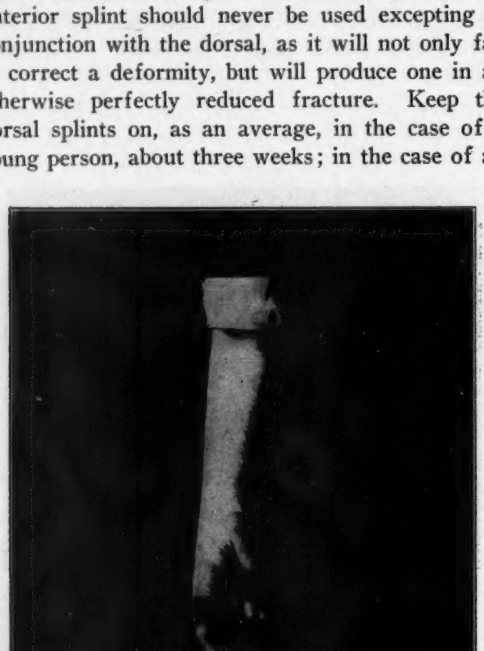

Fig. 6. Palmar splint removed and dorsal retained after first eight days.

old person, about four weeks; then remove all dressings excepting perhaps adhesive plaster, to support the wrist, and practice passive motion.

In some cases where the fracture is high, complicated with a fracture of the ulna, it may be impossible to hold the fragments in place without resorting to the open operation; but in my opinion we should never make a compound out of a simple fracture if there is any way to avoid it.

In cases where there are fragments of bone so located as to interfere with motion, it is better to wait for some time after the injury to expose the site of the fracture, not with the idea of replacing the bone, but to remove such pieces of bone in comminuted fractures as interfere with motion.

In impacted fracture, where the position is not good, give a general anesthetic, liberate the fragments, and reset the bone; if you do not, it will always give trouble.

Other methods of reducing and treating fractures, such as are given in books, I have purposely refrained from discussing. The facts as set forth in this paper are based entirely upon personal observation in my private practice and in clinic cases with Doctors Aud and Woodard. In am also indebted to Dr. Bayless for the excellent *x*-ray work he has done with the clinic cases.

After the study and treatment of not only Colles' fracture, but all fractures, I would like to quote Dr. John B. Murphy: "Put nothing into a fracture but common sense," and permit me to say further, the doctor who treats fractures most successfully is the one who uses common sense mechanically inclined.

THE TRANSPLANTATION OF FAT AND FASCIA FLAPS IN SURGERY.

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At the outset let it be understood that I have done no original work in this field. The information and the facts here presented have been obtained only by a perusal of the literature and a very small number of cases operated upon by me. It is my desire to give due credit to the classic articles by Kirschner[1] appearing in 1909 and Kleinschmidt[2] in 1914. The latter refers in his bibliography to 163 separate papers upon this subject. Since that time many new papers have appeared in various journals by other authors, so that the literature upon the subject is now voluminous indeed.

The credit for the establishment of free transplantation of fascia as a method in plastic surgery belongs to Kirschner, who published his experimental work in 1909 and a year later published a series of clinical cases.

The first work Kirschner did was to repair tendon injuries with tendons, but he encountered the difficulty of finding little autoplastic material available, so he began to use fascia for the purpose.

An earlier reference to fascial transplantation is the article of Bayard Holmes[3]. To correct an ankyloses of the jaw he interposed a pedicled flap of fascia belonging to the temporal muscle. The functional results were good after the operation. This and, no doubt, other isolated cases, show that fascia transplantation was occasionally used before Kirschner's article. Credit is generally given him

for originating the method because he was the first to write an extensive paper on it and to show by experimental work its various possibilities.

Kirschner states: "One of the chief reasons why fascia is such an excellent material for transplantation is that it heals without any reaction; both in cases where it is at rest and where rather severe functional demands are made upon it, autoplastic fascia shows a marked tendency to become incorporated with the neighboring connective tissue. This often occurs even when asepsis has not been perfect. Some surprising results have been obtained in covering over infected hollow organs. The transplanted fascia may undergo changes, such as swelling and vascularization and may be transformed into connective tissue and fat; but in many cases it remains intact in its original form. Fascia has the advantage over other tissues in that it is easier to obtain and in large amounts. There are no serious results which have followed even the removal of large areas of fascia lata."

Kornew[5] has made a careful histological study of the transplants in several series of experimental cases. He transplanted fascia to fill in gaps in the tendo Achillis in 30 rabbits and 3 dogs, repaired defects in the thoracic wall in 12 dogs and defects in the abdominal wall in five dogs. He found that the transplanted fascia took perfectly in its new location, no matter what size it was. When it is transplanted it is removed from its nutrient vessels, so that at first there are signs of beginning degeneration, shown by poor staining, swelling and even disappearance of the nuclei of the fascia bundles; but the fibers of the bundles scarcely change at all. The nutrition of the fascia is restored to normal after two or three weeks, when new vessels from the surrounding tissue penetrate the perifascial and endofascial layers of the transplant. The change is manifested by a more intense color and an increase in the size and number of the nuclei, but later the *size and number* decrease again to the normal. The transplanted fascia is enclosed on all sides by a mantle of new-formed connective tissue, which as time passes on takes on an almost fibrous character. This tissue penetrates the perifascial and endofascial layers but does not enter the fascial bundles.

Where great functional demands are made on the fascia, as when it is used to repair tendons, it gradually takes on the structure of the tendon, so that after three months it cannot be distinguished from it. When it is used to repair defects in the abdominal wall the same process takes place, but more slowly, the transplanted fascia finally assuming the structure of the surrounding tissue. In the thoracic wall, where there is less tension and where tension is more uniform, the fascia retains its original structure, even after a year, when all progressive processes have stopped. The elastic fibers of the fascia are not only preserved, but they increase and penetrate the surrounding cicatricial tissue, changing the character of the scar so that it becomes more elastic.

Hirano[6] used fascia experimentally upon 15 animals, dogs and rabbits, and reports his results as follows: Of the 15 cases, there was suppuration in 8, but in spite of the suppuration, the transplanted fascia remained in tolerably good condition. It remained wholly or partially in connection with the chest wall. In the seven cases that did not suppurate, the fascia lived and did not change its structure materially, though as time passed, more and more intimate connection was established with the surrounding tissues. Hirano states it did not change into fat tissue as reported by Von Saar, nor into connective tissue as reported by Denk. He also stated there was no adhesion of the lung to the fascia in three of the non-suppurating cases in rabbits and in two other cases only very loose adhesions by means of fine fibrous bands. In two cases where there were subcutaneous abscesses there were adhesions over only a small area at the site of the suture. When there were no adhesions the fascia was covered over with endothelium in a short time. Dogs are much more sensitive to intrathoracic operations than rabbits and also than man.

Fascia has been used practically in a great variety of situations: those in which traction is made on the transplanted fascia, as in bridging defects in muscles, tendons or ligaments, bridging defects in the walls of body cavities, fastening parenchymatous organs in place, in correcting prolapse, filling defects in bony cavities, in occluding the stomach or intestines, those in which pressure is exerted on the fascia, as in covering amputation stumps and when it is used to mobilize the resected ends of joints; those where no functional demand is made on the fascia, as in making sheaths for nerves, covering wounds in parenchymatous organs and in strengthening the lines of suture.

One of the chief uses of fascia is its substitution for joint ligaments, as in habitual luxation of the shoulder or knee joints. In the former joint Kirschner passes a band of fascia under the deltoid and over the joint capsule of the head of the humerus. Payr's[7] method, which has given excellent results, consists in fastening a triangular flap of fascia lata on the anterior side of the joint, its apex being fastened to the coracoid process and the flap sutured

with three rows of sutures to the pectoralis major muscle. A similar flap is then applied posteriorly, its apex being fastened to the head of the joint and the flap sutured in the same way as the anterior one to the infraspinatus and teres major muscles.

Fascial flaps are also used to replace the internal ligaments of the knee joint. Giertz,[8] in his method, uses two flaps of fascia, fastening them to the two epicondyles of the femur at one end and to the tibia and fibula at the other.

Fascia has also been used for the correction of flat foot, but the method is applicable only when supination can still be attained.

Fascia has also been used experimentally and clinically to replace paralyzed muscles. Payr had good results in a case of deltoid paralysis and Cramer in congenital bilateral paralysis of the trapezius.

Payr[16] has also reported the successful transplantation of fascia in a case of rupture of the biceps muscle. In his case the long head of the biceps was torn, the tendon was stretched and the muscle contracted into a round ball with inability of the patient to use it. A loop was made in the tendon, it was sutured into the muscle and a sheet of fascia sutured around it with good immediate results.

Fascia has also been used in the case of paralysis of the serratus magnus by passing a loop of fascia from the angle of the scapula around a rib lying in the course of the muscle fibers. Fascia transplantation has also been used successfully several times in ptosis of the eyelid, the strip of fascia being passed from the frontalis muscle to the tarsus. In facial paralysis a strip of fascia is passed from the angle of the mouth up and over the zygomatic arch.

Fascia is now being used extensively to replace tendons, as it is excellently adapted for this purpose. McArthur[9] advocates the envelopment of the transplant in a sheath of fat to prevent adhesions.

Fascia is an ideal material for covering defects in the thoracic or abdominal walls. In cases where it has been necessary to remove pleura or peritoneum and the defect is replaced with fascia, the transplant soon become covered with endothelium (Kornew, Hirano[10]). The flap must be made large enough to lap over the edges of the defect a little. Hernia has never followed the use of fascia in covering the defects in the abdominal wall. The fascia often takes even in an infected field of operation (Schmid[11]).

Kleinschmidt states that fascial transplantation should be done in practically all hernia cases, to prevent a recurrence. The fascia should be applied under tension and a large sheet should be used extending far beyond the lines of suture. The application of the fascia in femoral hernia is not as easy as in inguinal form. Wilms fastens a double piece of fascia to the posterior edge of Poupart's ligament, so that it hangs down like an apron in front of the internal femoral ring. He makes the piece large enough so that it covers the posterior side of the femoral vessels. It is not necessary to fasten the lower edge, for the intra-abdominal pressure presses it against the vessels and the inner side of the horizontal ramus of the pubic bone so that it quickly becomes adherent. Fascia may also be used in umbilical hernias and hernias of the linea alba if there is any danger of the closure not being firm enough.

Henchen[12] has successfully used fascia in experimental work to cover gaps in the diaphragm. His method of approach was from the thoracic side.

Korte in 1910 was the first to use fascia for the repair of dura, and since then he has been followed by many surgeons who have performed many such operations. The permanent as well as the immediate results were good where fascia had been used after recent injuries, after the removal of brain tumors and in plastic operations for cortical epilepsy. The fat of the fascial transplant should be turned toward the brain. Fascia has also been used to cover defects in the spinal dura as in spina bifida. The flaps must, of course, be longer than the defects and should be pushed under the edges of the bone.

Fascia is used to cover defects and to strengthen sutures in hollow organs, including the stomach, intestines, bladder, urethra, ureter, esophagus, trachea and bronchus. All these organs are either movable or change their form as they fill up so that the chances for healing by primary union are remote.

Fascia has also been used for suspension of the kidney. The method as used by Kirschner has been to pass a broad band of fascia through two small openings in the capsule at the upper pole of the kidney, then to be brought over the twelfth rib and sutured into a closed ring, which holds up the kidney. Kocher and Henchen take a broad strip of fascia and place it under the lower pole of the kidney, so that the kidney hangs in it as in a sling, which is fastened to the fibrous capsule. The kidney is then placed in its proper position and the fascia sling fastened to the lumbocostal and lumbodorsal fascia.

Fascia is also recommended to be used to strengthen sutures in blood-vessel work—especially where the suture is difficult or where the vessel wall is diseased.

It is also used in orchidopexy. Kirschner's method is to throw a flap of fascia over the testicle like a net over an air-balloon, using the free ends for fixation to the perineal fascia.

Fascia has also been used to correct rectal and vaginal prolapse and for ligating the pylorus. Wilms[13] in 1911 was one of the first to use it for pyloric exclusion, although Bogoljuborr[14] as early as 1908 had experimentally demonstrated its value. Wilms' method consists in putting the strip of fascia rather loosely around the pylorus, so that the opposite mucous surfaces of the pylorus touch each other, and suture the ends of the strip together. The fascia contracts later so that the closure is firmer.

Fascia seems to be especially well suited for mobilization of the knee joint and may be used either free or pedicled. Delital and Serza, pupils of Putti,[8] have shown not only that the functional results are good, but also that the fascia preserves its histological character. Fascial flaps, either free or pedicled, may be used in mobilization of the elbow joint, hip joint, wrist joint, jaw, etc. Pedicled flaps have been most used and have given brilliant results.

Fascia may be used for making sheaths for nerves after nerve suture and following traumatic injuries to nerves where the integrity of the nerve is in danger from compression or by adhesions to neighboring structures.

Fascia has been used to cover wounds and control hemorrhages in various parenchymatous organs, such as the liver, kidney, spleen, etc. Waljaschko[15] and Lebederr had shown experimentally that free transplantation of fascia does not call forth any proliferation of connective tissue inside the parenchymatous organ. To enclose a wounded or ruptured organ in a flap of fascia is the best substitute for suture; even if it is closely enveloped in fascia no atrophy of the gland tissue is produced. It is an important factor in prompt healing to remove the blood from the wound by suction before the fascia is applied.

In the following cases operated upon by me autogenous transplantation of fascia was used:

CASE I. Mr. J., janitor, age 42, November 23, 1913. Referred by Dr. Hunt. Admitted to St. Elizabeth Hospital at 9 P. M. on account of gunshot injury to the left hand. In the afternoon, while out hunting and in crossing over a log, the gun was accidentally discharged. The entire posterior *surface* of the hand with the second row of carpal and first metacarpal bones was destroyed. The extensor tendons were destroyed. Hemorrhage had been quite profuse but had ceased. Under ether anesthesia the wound was cleansed, the remaining fragments of the metacarpals and carpals removed and the tissue fragments trimmed. The tendons were united. The hand was materially shortened, but this was deemed superior to an artificial hand. Suppuration occurred and the union of the tendons gave way. Upon cessation of suppuration and cicatrization of the wound, effort was again made to unite the severed tendons. Accordingly, on January 21, 1914, the second operation was carried out. Through a crucial incision, with reflection of skin flaps, and after some effort, the ends of the severed tendons were found and union again accomplished. To cover over this defect and to cover and protect the tendons and prevent adhesions, a fat and fascial graft from the right thigh was taken. The graft measured two by three inches and was sutured over the tendons and annular ligament. Uneventful convalescence and union followed with almost complete restoration of function.

CASE II. Miss M. V., age 32, January 23, 1914, entered St. Elizabeth Hospital for the removal of a tumor involving the external suprapubic region, and also for a fibroid of the uterus. The tumor involved the ventral wall and was slightly to the left of the old scar of a laparotomy eight years before for a left ovarian cyst. Under ether anesthesia the tumor (fibroma) was removed from the abdominal wall. The muscles were not involved in the growth. An area two by three inches of fascial wall was removed. A supravaginal hysterectomy was done. To close up the large defect in the abdominal wall a fat and fascial graft three by four inches was taken from the left thigh and transplanted. Healing occurred by primary intention and convalescence was uneventful.

CASE III. Mr. L., blacksmith, age 51, large and corpulent. Entered St. Elizabeth Hospital February 9, 1914, with a large left inguinal hernia. It proved to be a large sliding hernia of the sigmoid. The sigmoid was freed and a flap of peritoneum incised on either side and sutured posteriorly and the viscus returned to the abdominal cavity. It was impossible to close the external ring owing to sparsity of fascial tissue—the defect being an area of two and a half by two and a half inches. A fat and fascial graft was taken from the patient's right thigh and sutured over the defect. Healing occured by primary union and convalescence was uneventful.

CASE IV. Mr. J. F., age 52, farmer, January 16, 1916. Referred by Dr. Laird. Was admitted to St. Elizabeth Hospital on account of urinary retention. Five weeks previously he had received an injury to the perineum from a fall from a haystack astride a fence. Following the fall the perineum and scrotum became markedly ecchymotic, but the patient was able to void his urine with some difficulty. This condition continued up to the day preceding his entrance in the hospital, when further voluntary urination became impossible. All efforts at catheterization were unsuccessful. Immediately upon his entrance in the hospital a suprapubic cystostomy was done under local anesthesia and 48 ounces of urine removed. Five days later a perineal urethrotomy was performed with the view of finding both ends of the urethra and bringing them together. The perineal urethra was found completely

destroyed and replaced by scar tissue. Attempts at dissection of the perineal and penile portions of the urethra were futile owing to the friability of the tissue and it became impossible to approximate the ends—the distance being a little more than an inch. A fat and fascial transplant from the thigh was rolled into a tube and sutured over both ends of the torn urethra, the fatty portion being toward the lumen.

Both suprapubic and penile bladder drainage were instituted and the wounds closed. All augured well for more than two weeks when the transplant extruded from the perineal wound and ten days later came away. Upon February 14th a third effort was made to bring both ends of the urethra together by a more radical dissection of the region which was then successful. Full recovery followed.

CASE V. Mr. W. S., age 32, farmer. Referred by Dr. Towne to St. Elizabeth Hospital December 6, 1915, with a compound comminuted fracture of the left temporal and parietal region, the contents of the cranial cavity oozing out. Hair and dirt were intimately associated with the wound. Fragments were removed and the area cleansed. A larger fragment, 1½ by 2 inches, was reinserted to assist in closing the large skull defect. A stormy convalescence followed and after a period of four weeks he was able to return home—a discharging sinus still present. Later the amount of discharge became more pronounced and he was advised to reenter the hospital. On March 7, 1916, the bone fragment was removed and an autogenous transplant of fat and fascia measuring 2 by 3 inches was inserted under the skull. Uneventful recovery.

CASE VI. Mr. A. M., aged 20, December 3, 1915, farmer. Referred by Dr. Johnston. Patient was injured about 10 o'clock in the morning while "flipping" a freight train. It was found upon his entrance into St. Elizabeth Hospital that he had a scalp wound over the vertex, the right arm was badly lacerated, all the tendons of the flexor and extensor surfaces were exposed, and there was a compound dislocation of the wrist joint. The ulnar and radial arteries were intact. The wound surfaces were filled with cinders and dirt and altogether the outlook for saving the arm was unpromising, but the attempt was made. The wound was sutured as best we could—the dislocation reduced and alcohol dressings applied. Some suppuration followed, but with no serious effects. Later, at various times, skin grafts were supplied to the uncovered areas, which in most part were successful. It was impossible to keep the dislocation of the wrist joint reduced. On March 31, 1916, after healing was complete in every way, the ends of both ulna and radius were resected and a fat and fascial transplant from the thigh inserted. Uneventful convalescence.

CASE VII. Walter K., age 17. Referred by Dr. T. D. Smith. Parents in good health. One sister, age 21, was operated upon recently by me for a pyloric ulcer. The patient had the usual diseases of childhood. At the age of 10 years he fell from a swing to the ground, a distance of 12 to 15 feet, striking upon the left side of his head. Unconsciousness followed the fall, but he does not know how long it lasted. There were no other immediate effects, and the next day he was about as usual. Three years later epilepsy developed. The convulsions occurred both at night and in the day time. The number of attacks was variable—several occurring in succession with several days' intermission. He complained of a "heavy" feeling in the *left temporal region. A skiagraph* showed pronounced thickening of the skull at the superior portion of the left parietal and occipital portions of the skull. A slight depression of this region was also noted. An exploratory operation was suggested, to which the family readily consented. Accordingly, on April 3, 1916, at Theda Clark Hospital, a section of skull involving the left superior parietal and occipital regions was removed. The bone was abnormally thickened. Many organized dural adhesions were encountered and freed. A fat and fascial flap from the left thigh, measuring 2½ by 3 inches, was transplanted to cover and fill in the defect. The fatty portion was placed toward the brain. Healing occurred by primary union. One very light "spell" occurred about a week later. After a period of two weeks the patient left the hospital. The time which has now passed is too brief to know what effect the operation will have upon the epilepsy.

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HYDROCELE AND ORCHITIS: THEIR RELATION TO TRAUMA.*

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It is my purpose to present this subject chiefly from the standpoint of the medical advisor in questions of liability for compensation or damages.

These conditions, like hernia, are frequently met in the practice of the general practitioner as well as in that of the surgeon; they furnish the basis for many claims in the files of the insurance adjuster and claim agent, and not rarely find their way into the courts before they are finally disposed of. These lesions, like hernia, afford a fruitful and tempting field for misrepresentation and fraudulent claims; they are as a rule easily concealed, so that their possessor can continue at his occupation and await such time as may to him seem an opportune moment for carrying out his long contemplated plan of posing as the victim of an accidental injury.

As a basis for my remarks I shall briefly relate several recent cases, which illustrate in a very concrete manner the unreliability of the history furnished by the patient in this class of cases, and the consequent difficulty of determining and correctly estimating the factors which may have participated in their causation.

CASE I. A middle aged laborer presented himself with a painful enlargement of the left testicle, claiming that he had been struck by the end of a board. He denied all knowledge of any enlargement prior to the injury, which he claimed to have sustained while at work, shortly before the examination. There was no evidence of trauma to skin or other structures. Venereal infection was denied, and there was no evidence of his having had gonorrhea, tuberculosis or syphilis. Chills, and fever, together with rapid increase of the size and painfulness of the swelling, clearly indicated a suppurative condition. Operation disclosed a suppurating dermoid cyst; he then admitted having had a marked enlargement of the affected gland since boyhood, said nothing more about the injury and made no claim for compensation or damages.

The tendency of dermoids to suppurative infection has long been recognized by the profession. That this tendency may be increased by trauma is possible, but the majority of suppurative cases give no history of injury.

*Read before the Milwaukee Medical Society, May 9, 1916.

CASE II. A laborer, about 30 years old, was seen within an hour after an alleged injury to the right side of the scrotum, caused by falling against the upper end of a shovel, covered at the moment by one of his hands. He was apparently suffering agonizing pain, and on the gentlest attempts at local examination squirmed and complained so excessively as to at once arouse a suspicion that he was simulating. The right side of the scrotum presented a large swelling, approximately five inches *in length and two to three inches in thickness, oval,* only moderately tense, and clearly containing thin fluid. Tenderness appeared to be uniform throughout the mass. Hernia was easily excluded. There were no urethral discharge, scars, or enlarged glands. He persistently denied ever having had venereal disease or having had any swelling whatever prior to the accident. The urine was normal.

He was put to bed, the parts well supported and hot moist compresses applied, but no anodynes allowed. The complaint of pain and tenderness disappeared with surprising rapidity, but no appreciable change in the size of the swelling took place during the following week. Diagnostic puncture resulted in the withdrawal of perfectly clear serum. Diagnosis, chronic hydrocele. At operation, seven days after the alleged accident, the tunica vaginalis was found distended with perfectly clear hydrocele fluid, which formed almost the entire mass of the swelling; the membrane itself was greatly thickened throughout and showed numerous patches of almost papillomatous thickening, but not the slightest evidence of recent injury or acute inflammation. The entire epididymis was enlarged to more than twice its normal volume, and markedly indurated throughout. The testicle itself showed no abnormality except a slight uniform enlargement. The vas was somewhat thickened, but not nodular. Extraserous transposition of the testicle was done, the thickened tunica partly dissected out and partly stitched back around testicle and cord. The wound healed per prima, and after a month's time only a slight enlargement of the gland remained.

The local conditions found in this case on first examination, as well as the findings at the operation, only seven days later, totally discredited this man's version of his history. Were it possible to get so great a distention of the tunica vaginalis within an hour's time, which I doubt, the swelling would certainly be exceedingly tense. The pathologic conditions found at operation were of an unmistakably chronic nature. If trauma was a factor in the case at all, it had merely acted as the cause of an acute attack of pain in a previously diseased organ. The case was clearly one of hydrocele associated with an infectious epididymitis, both of long standing.

CASE III. A track laborer, 18 years of age, claimed to have been injured while handling a heavy jack, the upper part of which struck him in the region of the left groin. On first examination, eight days after the alleged accident, the left testicle was found enlarged to three or four times its nor-

mal size, only slightly tender, decidedly harder than the average acutely inflamed organ, and of irregular consistence, the cord somewhat thickened, but containing no distinct nodules. There was no indication, in the form of ecchymosis or otherwise, of any injury to the skin or other tissues in the vicinity. He denied having had any form of venereal disease or any previous injury, and insisted that up to the time of the accident there had not been the slightest enlargement. He was put to bed, the parts well supported, and the enlarged organ treated for several weeks with applications of moist heat, repeated adhesive plaster strapping and other non-operative methods, without bringing about any change in the size of the swelling.

Chemical and microscopic examinations of his urine, Gram stains for gonococci, von Pirquet test for tuberculosis, and a Wassermann test all gave sion to the hospital an abscess developed on the anterior aspect of the swelling; this was found to extend into the gland proper, it was opened and kept well drained, but refused to heal completely. Finally the diseased testicle was laid wide open by an anterior longitudinal incision along its entire length. But the gland proper and the epididymis were found involved, the cavity of the tunica vaginalis largely obliterated by adhesions, the greater part of the gland parenchyma destroyed by suppuration or replaced by connective tissue proliferation of low vitality. Microscopic examination of portions of this tissue showed no evidences of tuberculosis or syphilis. The diseased tissue was freely excised, the cavity kept packed and complete healing resulted in about three months. At the time of discharge, the gland was nearly twice the size of its fellow, but free from pain or tenderness; he was in excellent general health, had gained considerably in weight.

The early clinical findings in this case were so entirely out of accord with the alleged history, that the latter simply had to be disregarded. The matter was not cleared until after the young man had been discharged and his case disposed of, when I met the boss of the gang in which he had worked, who informed me that for several months while working with his gang, the man had frequently complained of pain in the region of the scrotum, had asked for light work, had been engaged as a water carrier, and had not been allowed to handle a jack for several weeks prior to the alleged accident. If trauma had anything to do with his disability, it was in all probability by way of stirring up an old infection or bringing on an attack of pain in a previously diseased and enlarged gland.

CASE IV. A laborer, about 25 years of age, presented himself for examination about eight months after an alleged injury to the right side of the scrotum. His statement was that he received a blow with an implement, but was able to continue his work. There was no discoloration, or other mark of injury to scrotum or surrounding structures. The enlargement had increased slowly and in the course of a week reached a size about four or five times that of the other testicle. Since that time the enlargement has remained practically stationary. He has worked more or less throughout the eight months, and consulted a physician only two or three times. He denies all history of venereal disease, shows no scar, no enlarged lymphatics, no urethral discharge, no stricture, no indications of tuberculosis; the urine is normal, and his general health good. The swelling is oval in shape, the upper pole as broad as the lower, not translucent, not more sensitive to pressure than the normal gland; its lower portion feels uniformly firm, while the upper part gives decidedly the impression of containing fluid. Aspiration of the upper portion resulted in the withdrawal of clear serium, while lower down the result was negative. Operation disclosed a hydrocele of the upper portion of the tunica vaginalis, while its lower portion was partly obliterated by adhesion. The gland itself was about twice its normal size, and abnormally soft in its upper portion. The epididymis was not perceptibly enlarged and contained no nodules, nor were such found in the vas deferens. A free longitudinal incision was made in the sagittal plane of the gland, so as to lay its interior broadly open to view. This disclosed extensive pathologic changes in the gland structure proper, in the form of mild suppurative infection and partial necrosis in the upper part, while adjoining portions were the seat of undifferentiated connective tissue proliferation. These portions were freely excised, the resulting cavity treated with tincture of iodine, the remaining serous lining of the tunica vaginalis largely dissected out, and the entire cavity kept packed with iodoform gauze until it had firmly healed. In the course of about six weeks the testicle had been reduced to approximately its normal size and healing was practically complete. Microscopic examination of the excised tissue showed that it consisted of an undifferentiated mass of connective tissue, partly necrotic.

In this case we have a history and clinical picture which can be more nearly harmonized with the supposition of a traumatic causation, than in the cases previously related. An injury to the scrotum might have resulted in reaction in the serosa of the tunica vaginalis severe enough to give rise to adhesions and hydrocele, while a hematoma within the tunica albuginea and more or less crushing of the gland substance may have resulted in the conditions found within the organ. On the other hand, the statements of the patient as to the absence of all injury to neighboring parts, the absence of ecchymosis during the first week, the slow onset of the enlargement, his ability to keep at work, and his failure to make any mention of the matter to his employer until many months afterwards are considerations which may well cause one to doubt

the correctness of his version of the origin of the trouble.

That both the testicle and the serous cavity in which it rests are just as vulnerable as other similar structures of the body, needs neither proof nor argument. All serous membranes, when irritated, tend to over-production of serum, which under unfavorable conditions may result in more or less permanent accumulation and distension, the most typical and probably most frequent example of which we see in hydrocele. Inflammation of a glandular and vascular organ like the testicle, contained in a so comparatively unyielding fibrous capsule as the tunica albuginea, may result in a variable amount of destruction of its substance, or in chronic enlargement, or the opposite condition, atrophy, if for any reason resolution is delayed. In case of trauma there may be a direct crushing of the gland substance or an extravasation of blood within the capsule sufficient to destroy the vitality of the parenchyma.

These are undeniable possibilities, but as a matter of experience and observation I believe them to be of exceedingly rare occurrence as the result of trauma unaccompanied by extension and evident injury of adjoining structures. In making this statement I am not losing sight of the well-known fact that injury to internal organs may be inflicted without visible injury to the overlying skin.

While the testicle is not directly protected by any bony wall, it is nevertheless strikingly shielded from direct injury by the conformation and nature of its environment, its form, consistence and manner of attachment, and the ease with which its position is changed by reason of its serous covering.

Those who have had considerable experience with injuries to the region of the perineum, lacerations of the urethra and similar accidents, will agree that traumatic orchitis as an accompaniment of such injuries is exceedingly rare. Epididymitis and orchitis do sometimes occur secondarily in this class of cases, not as the direct effect of trauma, but through infection from the wound or from the urinary tract.

Most of us are familiar with the picture of moderate traumatic injuries to the scrotum and its contents. Nearly all are accompanied by some direct evidence of trauma, such as slight or extensive ecchymosis, either immediate or appearing after a day or two; some swelling, or abrasions of adjacent skin; the distension of the tunica vaginalis and swelling of the gland moderate in degree, pain and tenderness, usually severe at first, but soon moderating under appropriate treatment; never showing the typical persistent tenderness and shape of an acute infectious epididymitis; as a rule yielding readily to proper treatment and resulting in prompt and complete recovery. I do not, of course, refer here to extensive lacerations, or other major lesions, which conform to no type.

It is in the cases which are seen late that the difficulty of determining the true causative factors arises. While a reliable history would be of the greatest assistance, some of us have learnt by experiences such as those just related to discount or reject the patient's statements in so far as they are incompatible with our clinical findings and scientific reasoning. This attitude was well expressed by the older Hebra who, speaking of the unreliability of the history in the diagnosis of syphilis, said: "Wir haben uns von der Anamnese emanzipiert." (We have emancipated ourselves from the case history.) Possibly my experience in encountering dishonest claims of this nature may have been exceptional, but I have met them in individuals in all walks of life, and of all degrees of intelligence, among the well-to-do as well as among the poor. In cases of hernia in which our clinical and operative findings disprove the patient's claim of a recent trauma as the cause, it may at least be urged as a mitigating circumstance that the claimant may have had the hernia for some time without being aware of its existence, and that it attracted his attention for the first time after some accident or strain which caused it to become suddenly aggravated; but it is hardly conceivable that a marked enlargement about the scrotum could exist for even a few days and not be discovered by its owner.

Owing to the necessity of limiting the length of this paper and insufficient time to prepare a finished discussion of the subject, the consideration of other common etiologic factors, in contradistinction to trauma, must be entirely omitted, and I am aware of the incompleteness and fragmentary nature of my remarks. I hope, however, that enough has been said to emphasize and impress the necessity of exercising great care in sifting and weighing the evidence of trauma advanced by the patient for our acceptance, and to be constantly on our guard against imposition and fraud, more especially when questions of liability and damages are likely to arise.

Diagnostic Factors in Urinary Calculi.

The *x*-ray is but one out of three indispensable means of diagnosis in cases of suspected urinary calculi. The other two are: first, a careful history and physical examination; second, a cystoscopic exploration and study of the urinary findings from bladder and kidney.—C. W. Woodall in the *Albany Medical Annals.*

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WALTER M. BRICKNER, M.D., Editor

NEW YORK, JULY, 1916.

CHOLECYSTECTOMY VERSUS CHOLECYSTOTOMY.

For many years the relative merits of cholecystectomy vs. cholecystotomy have been one of the prolific sources of controversy among surgeons. About twenty years ago the standard operation of cholecystotomy was supplanted by that of cholecystectomy. Then the vast importance of the gall-bladder as a source of infection was recognized; this and the slightly increased mortality of total removal of the gall-bladder led to a reaction and the older operation of simple drainage of the organ was reinstituted. Following this reaction there was a readjustment of values, and surgeons attempted to settle the problem by studying the precise indications for each operation.

The controversy is again aroused by two recent articles, each written by a surgeon of wide experience in this field of surgery. We refer to the articles by Dr. E. S. Judd of the Mayo Clinic entitled "Cholecystitis: Changes Produced by the Removal of the Gall-Bladder" (*Boston Medical Journal*, June 8, 1916) and J. B. Deaver upon "Recurrence of Symptoms After Operation for Gall Stone Disease" (*Illinois Medical Journal*, June, 1916). Both attack the problem from different angles. The first comes out definitely in favor of complete removal of the gall bladder as the method of choice; the latter, while not definitely committing himself, suggests this very strongly.

Judd's argument is based on a number of premises. 1. That cholecystitis is an infection and that systemic infection (Rosenow) is the most important avenue of infection of the gall bladder. 2. That in experimental cholecystectomy and in a few observations upon human beings, there was invariably found a dilatation of the common and hepatic ducts, and possibly of the cystic duct. This dilatation is apt to be most marked in the hepatic duct, and least in the intestinal end of the duct. Furthermore, Judd found that eventually this dilatation with increased pressure overcomes the action of the sphincter (Oddi) at the intestinal end of the duct, causing a paralysis, and the bile passes into the intestinal with little or no resistance. 3. That it is now generally recognized that pancreatitis is due to bile entering the pancreas.

Assuming, therefore, the correctness of the observations of the last two premises, Judd concludes that pancreatitis is best cured or prevented by removal of the gall bladder. He is, furthermore, confirmed in his belief of cholecystectomy as the operation of choice by the fact that in the hands of the Mayo's the operation of cholecystectomy has no greater mortality than cholecystotomy.

Of course, we must remember that in the Mayo Clinic comparatively few acute suppurative inflammations of the bile passages are operated, and that perhaps the views of their surgeons might be differently colored had they a wider operative sphere. In intestinal cases, nevertheless, the arguments of Judd must bear considerable weight.

Deaver's paper is an interesting study of 1,031 operations upon the bile passages. Of these 42 were recurrences. It is not our purpose to review the many interesting data concerning the kind and causes of these recurrences. To us the significant fact is that in 34 the recurrence followed a cholecystostomy, while in only 8 had a cholecystectomy been done. When we find in addition that in 15 of the first group the cause of the recurrence was a stone in the gall bladder (10 cases) or the common duct (5), while in cholecystectomy, a stone was found in one of the ducts in only three instances, the superiority of cholecystectomy is made doubly manifest.

Deaver believes that the advantages of the latter operation are somewhat counterbalanced by the slightly increased mortality of cholecystectomy over cholecystostomy, although he admits that he practices complete removal of the gall bladder only in the severe cases.

At all events, it seems to us that these two papers place the advantage of cholecystectomy upon a surer basis.—E. M.

THE PATHOLOGY OF APPENDICITIS.

In these days when the clinical and operative aspects of appendicitis are so well understood, a discussion of the pathology of appendicitis may appear academic. But a proper understanding of the pathology of appendicitis, just as the pathology of any disease, has an immense practical import. To recognize whether the removed appendix is diseased or normal requires an ability that is not shared as plentifully among surgeons as it should be. As a consequence, we venture to say that many appendices are held responsible for obscure intra-abdominal conditions, when a more complete exploration of the abdomen would reveal the actual condition of affairs. Furthermore, when the surgeon does recognize an appendix as diseased, he does so more by instinct than by sound scientific reasoning.

These thoughts are aroused by the paper of Moschcowitz entitled "The Pathology of Diseases of the Appendix" (Annals of Surgery, June 1916), who gives his views based upon a systematic study of 1,500 specimens. He shows, in the first place, that the entire pathology of appendicitis centers around the lesion of the acute attack, which is as characteristic and as pathognomonic as the primary lesion of syphilis. He shows that it is a definite suppurative inflammation from the very beginning and is characterized by the formation and spread of a diptheritic membrane starting from the cysts of the mucosa. He demonstrates that appendicitis is always an enterogenetic and rarely, if ever, a hematogenous infection. Of very practical significance is the demonstration that a localized peritonitis limited to the site of the inflammation is constantly present after the first twelve hours (and perhaps earlier), so that the gross absence of a localized peritonitis without any other evidence, practically excludes an acute lesion in the appendix. He, furthermore, has never seen an acute "catarrhal" inflammation of the appendix, so that this term should never be employed. The only adjective that is justified in acute lesions of the organ is the term "suppurative."

He traces the spread and genesis of the primary lesion of the appendix, and shows that there is a strong tendency upon the part of the organ to heal itself. The organ either passes into the condition of complete necrosis or if healing takes place there is desquamation of the membrane with the formation of ulcers and changes in the other coats of the appendix exactly comparable to those in other tissues where suppuration has taken place.

If the process of healing is continued, these changes eventually result in various cicatricial processes, ending in either stricture of obliteration of the whole or part of the organ. Moschcowitz does not believe that a complete *restitutio ad urtegraw* ever takes place, so that it is safe to say that a normal appendix has never been the seat of an acute attack. Moschcowitz offers some simple rules for grossly diagnosticating healed appendices, of which he regards the following two as paramount: (1) Absence of mucosal cysts and (2) widening of the submucous connective tissue zone. Both these signs are easily demonstrable upon cross-section of the organ, which Moschcowitz holds is the only logical way of examining appendices.

Moschcowitz also arrives at the significant conclusion that chronic appendicitis is not a continuous inflammation, such as a majority of other chronic inflammations of the viscera, but an end product, every stage of which can be directly traced to the ravages of the acute attack. In his opinion, there is no such lesion as chronic "catarrhal" appendicitis. It is a healed process and nothing else. He therefore suggests the following as the only reasonable classification of appendicitis: 1. Acute suppurative appendicitis. 2. Healing or subacute appendicitis. 3. Healed or chronic appendicitis.

This paper should help appreciably in clearing up many obscure points in connection with the pathology of appendicitis.

PUBLIC HEALTH EDUCATION AND SENSATIONALISM.

With a public so hungry for facts that lead to physical betterment that, in the absence of truth they swallow with avidity falsehood and quackery, how great is the surgeon's responsibility! We denounce, when we have the time, fictitious "cancer cures," nostrums that are not remedies, dramas and moving pictures, purporting to teach the facts of life and race betterment, but which, in reality, often give the half-truth even more insidious than downright falsehood, but the denunciation is carried on in *medical journals* and in *medical societies*. When, as in the case of the "Bollinger baby," the twilight sleep propaganda, and other instances of like nature, the lay press *does* get hold of facts of professional import, these facts are dissolved in sensationalism even to the point of saturation, and the fine grains of scientific truth are lost sight of. Sensationalism is the very life blood of a large per cent. of the people.

Destructive criticism is easy enough, but what is the remedy? The modern slogan "preparedness" is perhaps more apt here than elsewhere. The

remedy is regular, systematic education of the laity, not when "they are up against it," but ever and always in the public press, in public lectures by surgeons and general practitioners of the greatest skill and erudition. We cannot hope, nor do we wish, to teach the public to be diagnosticians, to differentiate between carcinoma and some comparatively harmless skin affection; but what we do wish, and should accomplish, is to teach the difference between a regular practitioner working scientifically along the paths of truth, the self-exploiting quasi-scientist and the fraud-mongers who rob the community of health and substance. When one of these latter tells a patient that something which is hardly more than a pimple is a cancer and that he can cure it, and does so, the damage is confined to the patient's purse only, but when that patient tells some credulous friend who is really suffering with carcinoma, and that friend fritters away time and money, and too late comes to the realization that the disease is beyond the power to cure, the sin is grievous. Proper education should bring vividly before the public the dangers of taking risks with matters so grave.

Educational dramas and moving pictures that are intended to teach fundamentals of life and health should be passed upon by a jury of doctors that all errors and exaggerations may be eradicated. Such representations may have value, but their value consists in their strict adherence to truth. They must be beyond question. So, too, should be any article relating to health and life that appears in the lay press. Let one grain of error creep in, and the public is skeptical about the whole. The press should eschew the publications of such articles except from the pen of practitioners. They are the guardians of the health of the community and the welfare of the race, matters far too serious to be trifled with.—R. B.

Ovarian Cysts.

Don't tap or incise ovarian cysts. Whenever practicable remove them intact through a large incision.

It is now recognized that many of these cysts, though innocent in appearance, are malignant, and not a few cases have occurred in which, after ovariotomy by a small incision and trocar, the patients have returned with generalized cancer of the peritoneum owing to infection by cyst contents during the operation.

There is also a possibility that the cyst, especially if adherent to intestine, may contain pyogenic bacteria.—C. H. Whiteford in *The Medical Press*, April 12, 1916.

Surgical Sociology

Ira S. Wile, M. D., Department Editor.

Long Hours and Accidents.

In 1913 the State of Oregon passed a statute known as the Ten Hour Law. Recently the constitutionality of this law has been argued before the Supreme Court of the United States, in order to determine whether or not it violates the fourteenth amendment. In a splendid two volume brief, prepared by Josephine Goldmark and Mr. Louis Brandeis (until his nomination as Associate Justice of the Supreme Court of the United States obliged him to withdraw from the case), there is a wealth of material compiling the world's experience upon which legislation limiting the hours of labor is based. By quoting from the world's literature, they have arrayed a large volume of facts pointing out the dangers of long hours of labor to health, the health hazards of modern industry, the nature and effects of fatigue, and the bad effects of long hours on safety, morals and general welfare.

Regardless of the economic aspects, the health side of the question is of paramount importance. That the safety of workers is lessened by long hours is today beyond argument. The continued record of many years clearly illustrates the increased danger from accidents arising from fatigue, regardless of any other factor, in industry. Whether the physical surroundings be ideal or not, the strains of manufacture, such as speed or monotony of process increase the liability to fatigue. Fatigue itself influences attention, coordination and self control and lessens the inherent vitality of the worker.

The statistics of all countries and in all sections of the United States where adequate records have been kept show that the number of accidents tends to rise with the prolongation of hours of work. The most recent investigations indicate that the greatest number of accidents occur during the penultimate hour of work when attention and muscular strength are at their lowest ebb. During the last hour of work, the accident rate falls slightly, probably owing to the decrease in the rate of output and the psychological stimulation due to industry rest.

The study of accidents in the National Cash Register plant in Dayton, Ohio, shows that twice as many accidents happen in the second last hour of the morning and of the afternoon as occur during the first hour in the morning or the afternoon. The Cadillac Motor Company of Detroit for nine months shows 107 accidents in the first hour of the

day and 152 accidents in the fourth hour of the day. The Industrial Commission of Wisconsin reporting the accidents in January 1913 to June 1914 recorded 737 accidents during the first hour of work, 1,805 during the fourth hour, 1,546 during the ninth hour. These suffice to show the gradual increase of accidents with the increase of the number of hours of occupation.

The Imperial Insurance Department of Germany reported in all industries that only 4.94 per cent. of persons injured had been at work less than one hour, 8.63 per cent. between one and two hours, 9.21 per cent. between two and three hours, 11.28 per cent. between three and four hours, and 12.20 per cent. between four and five hours. The number of accidents has been shown to decrease with the reduction of hours. The greater the strain on attention required by the industrial process or occupation, the more reason exists for a shortening of the working day or a more frequent interruption of the day's toil with adequate rest.

Food and rest serve as an antidote of fatigue. The labor of the machinists and most industrial workers involves muscular strength, close attention and the diligent application of brain power. Obviously, with intensity of effort or prolongation of work or both, the destruction of nerve force is increased and the organization of the body is less competent to perform its normal activities. Under such conditions fatigue ensues or even relative exhaustion, reaction time is retarded, the attention flags and accidents are more apt to follow.

Thus again is an illustration afforded of the close relation existent between social and economic conditions and the development of hospital and dispensary systems. Our courts of law are clogged with litigation growing out of accidents. Our dispensaries, hospitals and consulting rooms are thronged by multitudes, whose very presence represents a shortcoming of our social system. The five thousand dollar a bed hospital would not require as much space nor would its cost of upkeep be so great if the accident rate were lowered. It has been demonstrated that shortening of the hours of labor does not decrease the economic output of manufactured articles. The shorter hours, however, do serve to cause a marked decline in the number of accidents. If there were adequate statistics as to the use of emergency wards in hospitals, it would undoubtedly be shown that the rush hours correspond more or less with the hours of greatest incidence of accidents in industry. A study of this kind would be of immense value to those who are seeking to secure protective legislation for industrial workers.

Book Reviews

The Ductless Glandular Diseases. By Wm. Falta, Vienna. Translated and edited by Milton K. Meyers, M.D., Neurologist to the Lebanon Hospital and to the Dispensaries of the Jewish and St. Agnes Hospitals, Philadelphia, etc., etc. With a foreword by Archibald E. Garrod, M.D. (Oxon.), F.R.C.P. (London), F.R.S. Physician to St. Bartholomew's Hospital, London. *Second Edition.* Octavo; 674 pages; 101 illustrations. Philadelphia: P. Blakiston's Son & Co., 1916.

The work of Falta in its original language has for long served as a rich storehouse for those interested in the internal secretions; and it is therefore a pleasure to welcome the book in an English garb. To those unfamiliar with "Falta," it is well to state that in this book the author discusses the pathological and clinical phenomena of most of the diseases that are associated with disorders of the organs of internal secretion. While the discussion is on broad clinical lines, emphasis is obviously placed upon the relations to internal secretory changes. The book is molded upon the best Teutonic lines. It reveals a wide systematic and thorough grasp of the best literature, and a critique that nicely differentiates between the known and the disputed data. The thoroughness of the text is shown in the tabulation of 68 pages of references, all of which enters to a greater or lesser degree into the text. The translator has increased the value of the book by adding comments from American sources, which had been overlooked by the author. The translation has been ably done.

The Starvation Treatment of Diabetes. *With a Series of Graduated Diets* used at the Massachusetts General Hospital. By Lewis W. Hill, M.D., Children's Hospital, Boston and Rena S. Eckman, Dietitian, Massachusetts General Hospital, Boston. With an introduction by Richard C. Cabot, M.D. *Second Edition.* Duodecimo; 131 pages. Boston: W. M. Leonard, 1916.

Although in existence but a few years, the Allen treatment has already had a wide acceptance, and will probably become a routine in the management of diabetes. In this little brochure, the details of the treatment are given in full; with diet lists and methods of preparation that have been successfully worked out in the Massachusetts General Hospital. A smaller first edition was reviewed in these columns.

Books Received

The Mortality from Cancer Throughout the World. By Frederick L. Hoffman, LL.D., F.A.S.A., Statistician, The Prudential Insurance Company of America; Chairman, Committee on Statistics, American Society for the Control of Cancer; Member American Association for Cancer Research, etc. Octavo; 826 pages. Newark, N. J.: The Prudential Press, 1915.

A Manual of Gynecology and Pelvic Surgery for Students and Practitioners. By Roland E. Skeel, A.M., M.S., M.D., Associate Professor of Gynecology, Medical School of Western Reserve University; Visiting Surgeon and Gynecologist to St. Luke's Hospital, Cleveland; Fellow of the American Association of Obstetricians and Gynecologists, etc. Duodecimo; 680 pages; 289 illustrations. Philadelphia: P. Blakiston's Son & Co., 1916. $3.00 net.

Tobacco Habit Easily Conquered: How to Do It Agreeably and Without Drugs. With Appendix: "Tobacco, the Destroyer." By M. MAC LEVY, author of "Back to Life," etc. Duodecimo; 157 pages. New York: ALBRO SOCIETY, INC., 1916.

Elements of Active-Principle Therapeutics. By J. M. FRENCH, M.D. Duodecimo; 128 pages. Chicago: THE ABBOTT PRESS, 1916.

Lateral Curvature of the Spine and Round Shoulders. By ROBERT W. LOVETT, M.D., John B. and Buckminster Brown, Professor of Orthopedic Surgery, Harvard University Medical School; Surgeon to the Children's Hospital, Boston; Surgeon-in-Chief to the Massachusetts Hospital School, Canton; Consulting Orthopedic Surgeon to the Boston Dispensary, etc. *Third Edition*, revised and enlarged. Octavo; 213 pages; 180 illustrations. Philadelphia: P. BLAKISTON'S SONS & COMPANY, 1916. $1.75, net.

Man an Adaptive Mechanism. By GEORGE W. CRILE, F.A.C.S., Professor of Surgery, School of Medicine, Western Reserve University; Visiting Surgeon to the Lakeside Hospital, Cleveland. Edited by ANNETTE AUSTIN, A.B. Octavo; 387 pages; 88 illustrations. New York: THE MACMILLAN COMPANY, 1916.

Traité de Gynécologie. Par FORGUE ET MASSABUAU, Professeurs à la Faculté de Medicine de Montpelier. 1 vol. gr. in-8; 928 pages; 286 figures, noire et coloriés. Paris: J. B. BAILLIERES ET FILS, 1916. 25 francs.

Progress in Surgery

A Résumé of Recent Literature.

Umbilical Dyspepsia. C. D. AARON, Detroit. *Journal American Medical Association*, May 13, 1916.

Congenital defect of the abdominal wall at the navel is, according to Aaron, a rather common occurrence. Only when there is protrusion do we regard it as a hernia which, however, may be produced in these cases by anything causing increased abdominal pressure. This umbilical opening may be very small and escape notice. It is always congenital. All these patients have symptoms of nervous dyspepsia due to increased irritability of the autonomic nervous system. They may be free from the symptoms for days and have them recur from some trivial cause. The appetite is apt to be capricious. Fulness of the head, headache, vertigo, lassitude and depression may be complained of, as well as uneasy sensations one or two hours after meals or a heavy feeling immediately after eating. The patient is usually constipated, but the nutrition is good, though loss of weight may result from voluntary refusal of food. Palpation with the ball of the finger over the umbilicus causes severe pain which may radiate in different directions or be referred to some distant part of the abdomen. The stomach may functionate normally, but hyperacidity is sometimes present and chemical examination of stomach contents shows hyperacidity in all cases. The principal idea of treatment is to eliminate irritation of the patent umbilicus. The following directions are given by Aaron: "This is best accomplished by bringing the edges of this congenital opening as close together as possible with adhesive plaster 2 inches wide and long enough to extend from 2½ to 4 inches on either side of the umbilical opening. The surface of the abdomen where this is to be applied is thoroughly cleansed with soap, water and alcohol. One must be particularly careful that the umbilicus itself is well cleansed. If there is an excessive growth of hair on the abdomen, it is shaved off with a safety razor. I have found this instrument much more satisfactory than the ordinary razor. The first piece of adhesive is applied in the following manner: The edges of the navel are approximated by an assistant, and the strip of adhesive is applied directly over the umbilicus and drawn as tightly as possible. Without an assistant the binding can be done by applying the adhesive to one side of the abdomen and then pressing with the hand on the opposite side, and fastening the other end of the plaster to this side. The puckering of the skin in the midline is smoothed away. The remaining two strips of plaster are fastened so as to overlap the central strip above and below. In this manner we have been able to give almost immediate relief from pain and the distressing symptoms. The patient is able to take his bath in the same manner to which he has been accustomed, as the adhesive is very resistant to the action of water. Its removal when loose is facilitated by the use of ether or oil of wintergreen. This treatment is usually continued from four to ten weeks. On removal of the adhesive, one will often find vesicles and sometimes pustules in the area which has been covered. A single application of tincture of iodin over this area will go far toward clearing up these eruptions. If necessary, application of the adhesive may be discontinued for several days at a time." These eruptions usually yield to tincture of iodin. An elastic abdominal support is a valuable adjunct to the treatment.

Duodenal Ulcer. STRAUSS and LEVA. *Jahreskurse fuer aerztliche Fortbildung*, March, 1916.

The American viewpoint (Mayo, Moynihan, etc.) is being rapidly accepted, though many still doubt the frequency of the disease, and some still claim that gastric ulcer exceeds in frequency the duodenal. This depends to a great extent on how one classifies pyloric and juxtapyloric ulcers. The association of chronic appendicitis with duodenal ulcer is noted, Kümmel claiming that chronic appendicitis is associated with 75 per cent. of ulcers. Strauss says that rebellious forms of hypersecretion or hyperacidity speak for a parapyloric ulcer. *X*-ray shows normal motility in 40 to 50 per cent., hastened motility in 30 to 40 per cent.

The association of neurotic symptoms with ulcer is noted, Von Bergmann speaking of disturbed motor, secretory and sensory control.

Treatment: Surgery restricted to cases with stenosis or repeated bleeding or perforations. Other cases should have prolonged treatment with restricted diet, medication, rest, etc. Kümmel thinks surgical end-results better than with gastric ulcer cases. The necessity for "ulcer treatment" after operation is much emphasized (Strauss).

The Radiographic Picture in Gastric and Duodenal Ulcer. The *x*-ray is only a means in diagnosis and the report should be so interpreted. Repeated pictures and fluoroscopic exposures should be taken, and the report confirmed only if there is correspondence and permanence in the findings.

The characteristic symptoms are:

1. Antiperistalsis.
2. Increased peristalsis and motility with six-hour residue.
3. Hypertony.
4. Mechanical deformation of the stomach by scars.
5. "Nischen syndrome."
6. Hour-glass stomach, true and spastic.
7. Enlarged and deformed duodenal bulb (Cole).
8. Delay in emptying of duodenum.
9. Displacement of pylorus to the right.
10. Fixation of pylorus on massage and change of position.
11. Localization of pressure point.

Occult Bleeding. Considerable reliance is still placed on occult bleeding. Phenolphthalein test not so reliable or delicate as the benzidin test.

The blood test is valuable as indicative of open ulcer; negative results point to closed or healed ulcer. Occult blood test is not reliable as differential between ulcer and cholecystitis since in the latter it may occasionally be positive. Bleeding in carcinoma is more common and constant.

Excision vs. Gastro-Enterostomy. VAN BUREN KNOTT in *The Saint Paul Medical Journal*, June, 1916.

Knott contends that, although gastro-enterostomy has become an almost routine practice in the treatment of gastric and duodenal ulcers by good surgeons, it is frequently employed where indications for its employment do not exist. It is therefore coming into disfavor, rather because of its abuse than because of its proper and legitimate use. His reason for protesting against the employment of gastro-enterostomy in many instances is that statistics from large clinics show that seventy per cent. of cases of cancer of the stomach are the outgrowth of old ulcers.

Except in the pyloric region, ulcers are not excised as frequently as they should be, he thinks. The fact that patients treated by gastro-enterostomy require a second operation for the removal of the ulcer should be well noted. Ulcers situated upon the anterior surface of the stomach and not involving the curvatures may be readily excised and should, in practically every instance, be so treated.

If several ulcers are present in the pyloric region or if the thickening and induration are extreme, pylorectomy should be performed, but this should be only where the pyloric involvement is quite general.

Ulcers upon the posterior wall of the stomach may be excised, either by employing the rotation method of Summers' or the transgastric method of Chaput, Deaver and others.

Gastro-enterostomy may, however, be frequently necessary as a supplementary procedure.

Post-Operative Ileus. WILLIAM M. THOMPSON, *Surgery, Gynecology and Obstetrics*, June, 1916.

The mortality following inflammatory ileus as in cases of pyosalpinx with pelvic abscess, pelvic appendicitis with abscess and extensive adhesions is so high that any measure calculated to lessen it is acceptable. In the experience of the author—and in this he only confirms the conviction of many others—the best results in the treatment of inflammatory ileus is by enterostomy and drainage. This is especially of life-saving value in cases that are so ill that medical measures would be fatal. The adhesions should not be disturbed in doing the enterostomy. When recovery takes place the enterostomy opening may be closed by doing an ileo-ileal anastomosis and a cecostomy or appendicostomy will complete the cure. In favorable cases these procedures may be combined in the first instance for drainage and to relieve the back pressure in the colon. Restoration to function may be accomplished even after vascular changes have taken place. It is better to put the damaged gut at rest by short circuiting than risk life by the more serious resection.

The Value of Deep Percussion in the Diagnosis of Subacute Intra-Abdominal Disease. H. NEUHOF, New York. *Archives of Diagnosis*, April, 1916.

In subacute and subsidiary intra-abdominal affections, especially in obese individuals and those in whom by ordinary palpation no tenderness can be elicited, Neuhof practices deep percussion and has found it valuable. There are two ways to make deep percussion: 1. By ordinary percussion as in chest examinations. 2. Tapping the abdominal wall with the crooked finger. By these methods Neuhof has frequently discovered a limited area of tenderness which indicates the site of the organ involved.

Bleeding Nipples. DEAN LEWIS, *Surgery, Gynecology and Obstetrics*, June, 1916.

Bleeding nipples are most frequently associated with intracanalicular papillary cystadenomata and the adenocystic type of chronic mastitis. The discharge is serohemorrhagic, hemorrhagic or brownish and cannot be taken as indicative of malignancy. In the opinion of the author as well as Rodman, this symptom is associated with papillary cystadenomata, which in themselves are the result of involution changes.

Sex Gland Implantation: Additional Cases and Conclusions. G. F. LYDSTON, Chicago. *Journal American Medical Association*, May 13, 1916.

Lydston reports three cases additional to those previously published by him and his conclusions to date in regard to the implantation of the sexual glands. His conclusions, in substance, are as follows: For hormone therapy purposes, successful total or partial heteroimplantation of human sex glands is practicable in either sex. By successful he means the formation of a new blood supply and more or less prolonged existence of the gland with hormone production. The prospect of success from anastomotic implantation at present is not brilliant. Glands from the living subject are most desirable, though rarely obtainable, and those from the healthy dead body taken before the beginning of decomposition are of value. The glands of the male can be successfully implanted in the female and the reverse is probable, but the female tissues are apparently more hospitable. The physiologic and therapeutic results are independent of the site of implantation, but the vicinity of the peritoneum and canal of Nuck in the female and the tunica vaginalis in the male are sites of election. The blood pressure apparently is modified, and senility may possibly be delayed and longevity increased. It is probable that arteriosclerosis in its early stages may be benefited and senile dementia may be benefited. The climacteric may probably be postponed and defective psychic or physical or sex development are definite indications for the operation and certain psychopathies such as dementia praecox may possibly be benefited by implantation. Chronic diseases of the skin due to or modified by nutritional disturbances may be benefited and possibly cured. All conditions incidental to sex gland mutilation in either sex afford positive indications, benefit being probably inversely as the length of time that has elapsed and the age at which it occurred. In properly selected cases successful implantation ought to increase physiologic activity with all its benefits, and all morbid conditions in which malnutrition exists are likely to be benefited by sex hormones.

Thorium: A New Agent for Pyelography. J. E. BURNS, Baltimore. *Johns Hopkins Medical Bulletin*, June, 1916.

The chief objection against collargol is that it is an irritant when it escapes into the tissues; indeed, a number of deaths have been reported following its use. Burns has been experimenting with various solutions of thorium and has devised a solution which in his opinion is ideal for purposes of pyelography. He has used it in 125 cases and no untoward effects have been observed. He concludes:

1. Thorium solution fulfills all the conditions necessary for an ideal pyelographic medium.

2. Clinically, there has never been the slightest evidence of toxicity in a series of one hundred and twenty-five cases, the amounts used in a single case varying from a few cubic centimeters to almost a liter. This alone is proof of its non-toxicity.

3. Experimentally, although in a few instances death has followed the injection of large doses into the peritoneal cavity and tissues of animals, larger doses intraperitoneally and intravenously have produced no ill effects.

4. That the solution is non-irritating is shown by the absence of urinary symptoms after its use, and the absolute lack of any such evidence cytoscopically, and at operation.

5. The pyelograms and cystograms made with this solution show a splendid shadow which possesses an unusual clearness of delineation.

6. The solution is clear and watery; therefore it possesses a great degree of fluidity, permitting its ready elimination from the urinary tract.

7. It is perfectly clean and does not stain the linen. In this particular it possesses another marked advantage over other solutions, particularly those of the silver salts.

8. It is quite inexpensive, being about one-third as costly as collargol.

Variations in Renal Function Dependent on Surgical Procedures. D. F. CAMERON, Minneapolis. *Journal American Medical Association,* June 3, 1916.

The results of an investigation of changes in renal function produced by operations performed under general anesthesia and of the various changes in renal activity dependent on the relief from back-pressure of urine are reported by Cameron. The rate of excretion of phenolsulphonephthalein and the concentration of urea in the blood are taken as indexes of renal activity. They were chosen because of their recognized value and because of the easy performance of the tests. The following is the author's summary of these results: "The agreement between phenolsulphonephthalein and blood urea tests is, as a rule, very striking, though not infrequently a low phenolsulphonephthalein excretion is associated with a normal or only moderately increased blood urea concentration. These tests are of great importance in selecting the most opportune time for operation so far as renal function is concerned. Following an operation under a general anesthetic there is, as a rule, an increase in blood urea concentration. This increase is most marked after operations on the urinary tract and especially on patients who already have diminished renal function. In a small series of cases this increase was slightly more marked following operations under gas-oxygen-ether anesthesia than following similar operations under ether. Blood urea determinations are of great value in the diagnosis and prognosis of uremic states. Not infrequently blood urea concentration can be determined when other renal function tests are very difficult or impossible."

Supernumerary Ureter. Report of a Case of Complete Unilateral Duplication. A. R. SIMON and H. O. MERTZ, Laporte, Ind. *Journal American Medical Association,* May 27, 1916.

A case of complete unilateral duplication of the ureter is reported by Simon and Mertz, who discuss the importance and surgical significance of the condition and its detection. The symptomatology is not sufficient for this, but the cystoscope will show many such cases, and there is always some irregularity in the bladder picture. If the opening of the third ureter is obscured by mucus, as in the case reported, or occurs among the folds of the trigon or vesicle neck, chromoureteroscopy may be necessary. The Roentgen ray alone may suggest the anomaly, but not give an accurate diagnosis. It is most often the ureter draining the cephalic pelvis which has the abnormally placed opening, which is usually lower and nearer the mid line conforming to Weigert's rule. The following are the author's conclusions: "1. Supernumerary ureters are more common than generally appreciated by the clinician. 2. They may be productive of a pathologic condition demanding surgical correction. 3. An otherwise benign condition may be rendered malignant through the association with a supernumerary ureter. 4. Their recognition is possible in every case. 5. In our case, the unilateral duplication had a direct bearing on the progress of the pathologic process."

Hexamine as a Urinary Antiseptic. J. W. THOMSON WALKER, M.B., London, *Medical Press & Circular,* April 5, 1916.

A study of the chemistry of hexamine in the urine leads to the following conclusions as to its use:

(a) In acute bacillus coli infection: Urinary antiseptics should not be used in the acute stage. Alkalies must be given till the urine is alkaline and this must be continued for three to four days. The temperature becoming normal, if infection is still evident in the urine, hexamine should be given and increased in dosage till the limit of tolerance is reached. In acute acid cystitis the use of urinary antiseptics of the formaldehyde group is to be deprecated, since irritation of the bladder results.

(b) Alkaline cystitis: Here hexamine can have no action and the urine must therefore first be rendered acid by acid sodium benzoate or ammonium benzoate. Boric acid may be used to advantage. When the urine has been rendered alkaline hexamine is added.

Simple Subparietal Rupture of the Kidney. F. GREGORY CONNELL, *Surgery, Gynecology and Obstetrics,* June, 1916.

Subparietal rupture of the kidney may occur without associated shock, injury to other organs and external evidence of trauma. The diagnosis is frequently made by the history of abdominal contusion followed by tenderness, rigidity and hematuria. This is not the case when there is only slight injury; on the other hand serious injury to the kidney sometimes escapes detection. In this event only exploratory incision can determine the true nature of the lesion. Expectant treatment should only be carried out when there is fairly positive proof of the absence of serious injury. Nephrectomy should be reserved for very extensive lesion of the organ or for late cases. In the majority of early cases conservative treatment, preferably by suture, is the proper indication.

Hereditary Syphilis as an Etiological Factor in Spurs on the Os Calcis. PAUL B. SWETT and H. F. STOLL, *Surgery, Gynecology and Obstetrics,* June, 1916.

Nine cases of spurs on the os calcis form the basis of this paper. In a certain proportion of these cases the authors have found sufficient evidence to lead them to the conclusion that the inflammatory process is one traceable to hereditary lues. The pain due to the inflammation disappears under treatment. They differ from Murphy, who claims that the lesion is due to an accompanying bursitis. Operation of these spurs of the luetic type is indicated only when they cause pain by mechanical pressure on adjoining tissues.

The Technique and Results of the Open Method of Operation on Bones and Joints. C. H. MCKENNA, Chicago. *Journal American Medical Association,* May 13, 1916.

The subject of the open or closed method of the treatment of fractures is specially taken up by McKenna, who endorses Albee's opinions that the open method should not be employed except by specialists and with exact and precise technic and the greatest possible perfection and adaptation of instruments. As regards the final points of technic, he insists on the careful preparation of the limb by shaving and washing with green soap, alcohol and ether before operation, and after drying, dry boric powder covered with sterile gauze is applied forty-eight hours preceding the operation. Three coats of iodin are applied to the dry surface just before operation. All material used must come directly from the sterilizer and not be touched by the gloved hands of doctors or nurses. Nothing but instruments and sponges should be allowed inside the wound. The skin in all cases is closed with silkworm gut suture. Open operations should never be performed until Roentgen examinations or consultation, or both, conclusively show that good results cannot be obtained otherwise. The lack of resistance to infection of bone tissue requires special technic not needed in ordinary surgery and the introduction of foreign substances like nails and plates should be avoided if possible. In cases with marked deformity, however, they may be essential. The bone implant or autotransplant with intact periosteum intact in indicated cases should be the material of choice for the surgical reconstruction of fractures. The intact periosteum is needed for the greatest protection of the nutrition of the graft.

Laminectomy With Simple Exposure of the Cord: Its Effect on the Reflexes and on the Symptoms of Spinal Disease. C. A. ELSBERG and PEARCE BAILEY, New York. *Journal American Medical Association,* June 10, 1916.

The effects of laminectomy with simple exposure of the spinal cord in a number of cases with more or less severe spinal symptoms are described by Elsberg and Bailey. In 1912 they had published a paper on the subject under the title of "Spinal Decompression," but in only two of the cases was there really an actual increase of intradural

pressure found. In his present article they treat of cases in which there is no question of compression, and in which the exposure itself is the only agency to account for the change in symptoms produced and which admit of no other conclusion. In many cases the spinal reflexes are almost immediately affected, becoming markedly depressed or disappearing altogether within thirty minutes, and the depression or disappearance persisting from six to twenty-four hours. Trauma of the cord, since frequently there is no injury to the cord appreciable and the same effects often follow simple spinal puncture, cannot explain the matter. They mention instances in which marked improvement, though often temporary, occurred from the procedure and several cases of recovery after this simple operation in patients suffering from multiple sclerosis, syphilitic paraplegia, occurred. The conclusions offered from their experience are as follows: "1. The free removal of spinous processes and laminae with opening of the dura, in the absence of increased intradural pressure or a discoverable lesion, may be followed by a disappearance of normal cutaneous and tendon reflexes for a number of hours, or may be followed by the temporary return to the normal of pathologic reflexes. 2. The operation of laminectomy may have a profound effect in certain pathologic states of the spinal cord and may so modify or check the disease that a return to normal conditions is even possible. 3. On account of the relative safety of laminectomy in experienced hands, except in the region of the conus and cauda equina, and for the reasons stated above, exploratory operations should be done more often."

Some of the Surgical Aspects of Painful Back. W. E. SHACKLETON, Chicago. *Journal American Medical Association,* May 20, 1916.

Shackleton discusses some of the surgical aspects of painful backs, a condition more common than is generally supposed and a potent factor in the causation of sciatica, scoliosis and backache in patients who have been treated medically for lumbago, rheumatism, and sciatica without relief, as well as surgically for cord tumors and Pott's disease and supposed pelvic and abdominal conditions and tumors of the cord. The cause of the pain and disability in these cases is an anatomic variation in the size or shape of the transverse process of the fifth lumbar vertebra, sometimes spoken of as the lumbar rib, which occurs about as often as other anatomic variations. In the majority of cases the conditions are undoubtedly acquired during years of hard labor in unnatural postures and they are more common in middle adult life and among the male sex, though cases have been reported in patients of an early age. Occupation, while a frequent cause, is not the only one. Fractures and syphilitic growths are also probably to be considered as sharing in its etiology. The pain is not always produced in the same way. It may be caused by impingement of the process on the ilium and the transverse process may act as a fulcrum separating the sacrolumbar joints. In one case of Adams, it was due to the result of constant friction eroding the ilium. The anatomical details in regard to the course and distribution of the fifth lumbar nerve are described. Shackleton has found but twenty cases reported in the literature and adds three, two of them already operated on and the other one still under observation. The results of operation were most gratifying.

Hallux Valgus. C. F. PAINTER, Boston. Boston *Medical and Surgical Journal,* May 4, 1916.

Painter reviews the pathology of hallux valgus and concludes that hallux valgus is not an exostosis of the metatarsal head, but is a simple lateral deviation of the great toe, accompanied by stretching of the internal capsular ligaments. The treatment, therefore, is simple. If the deformity can be corrected manually, an attempt should be made to correct it by mechanical means, employing night splints to adduct the toe; toe posts in the day time and proper shoes. If of long duration, operation is usually necessary. Painter recommends the Hüter operation, consisting in removal of the head of the metatarsal bone, combined, when necessary, with removal of the enlarged bursa. In order to overcome the tendency of the phalanx to ride up after removal, Painter applies a metal splint for some weeks after operation, until the capsule has so shrunk as to hold the bone in place.

Results from Blood Transfusion in the Treatment of Anemia and the Hemorrhagic Diseases. E. W. PETERSON, New York. *Journal of the American Medical Association,* April 22, 1916.

The results from blood transfusion in severe posthemorrhagic anemia and hemorrhagic disease are discussed by Peterson, whose interest in the subject was aroused by the benefits obtained from the method in a case of severe postpartum hemorrhage. After a transfusion which, as Hartwell has pointed out, should be considered a homologous transplantation of tissues, the recipient's blood will show an increase in red cells, in hemoglobin, and decrease of coagulation time. It is indicated, therefore, in hemorrhages of various types, in selected cases of anemia, and in toxic and septic conditions. The results obtained by it in thirty-four transfusions in twenty-three cases and from four intramuscular injections of blood are reported. The cases treated included those of hemophilia and purpura, as well as direct or secondary hemorrhage. Case reports are given of some of these conditions. The general results are summarized substantially as follows: Transfusion of blood, intramuscular injections of whole blood and intravenous and subcutaneous injections of homologous serum are the most efficient measures, in the order named, in the treatment of hemorrhage and hemorrhagic diseases. In severe cases of acute posthemorrhagic anemia blood transfusion is the best and sometimes the only efficient means of preventing death. In chronic posthemorrhagic anemia, provided the cause of bleeding is removed or remedied, no other measure will compare in efficacy in producing hematopoietic stimulation. In pathologic hemorrhage transfusion has often proved effective after other measures have failed and should be resorted to in cases that do not respond properly to simpler methods.

An Experimental Study of the Use of Sodium Citrate in the Transfusion of Blood by the Direct and Indirect Methods. WM. S. CARTER, Galveston, *Southern Medical Journal,* May, 1916.

Carter carefully reviews the literature on transfusion and then gives his own experimental work on animals which leads him to the following conclusions:

Sodium citrate is a satisfactory anti-coagulant when used in the cylinder for direct transfusion in two per cent. solution. Transfusion can be continued from 2.5 to 3 times longer with a two per cent. citrate solution than can be done with physiological solution.

A solution of sodium citrate is as efficient as one of hirudin, as shown by the amount of blood transfused or by the time of transfusion.

Sodium citrate does not lessen the coagulability of the blood and is not toxic in the amount used either for direct or indirect transfusion.

The coagulability of the blood is temporarily increased immediately after transfusion in which citrate is used, either by the direct or the indirect methods.

The lethal dose of sodium citrate in dogs is about 1.0 gram per kilo of body weight when dilute solutions are injected. Even when a concentrated solution is used it is not more than 0.5 gram per kilo. A 0.2 or 0.3 per cent. solution is sufficient to prevent coagulation and does not have any toxic effect in the amount used for indirect transfusion in man.

The Importance of Auscultation in the Diagnosis of the Vascular Injuries Accompanying Gunshot Wounds. G. MAKINS. *The Lancet,* April 15, 1916.

Makins reports three cases in which auscultation of the vessel revealed an artino-venous aneurism before the other characteristic signs of the aneurism appeared. Makins suggests, therefore, that auscultation be carried out as a routine procedure in multiple gunshot wounds of the limbs.

The Treatment of Nevus Flammeus (Port Wine Mark) and Allied Conditions by Filtered Violet Rays, Employing the Compression Method of Application. W. L. CLARK, Philadelphia. *Therapeutic Gazette*, May 15, 1916.

Clark reports ten cases, and, if we may judge by the illustrations, the results are brilliant. For details of technic, the reader is referred to the original paper. Clark concludes as follows:

1. "Port-wine" nevi, telangiectases, rosacea, and other superficial vascular skin lesions may be treated with good cosmetic results.
2. Powerful ultra-violet rays with screens to filter out the red, yellow, and green, and compression by means of a quartz lens, are necessary for success.
3. The treatment will improve scars caused by caustic agents sometimes used to treat these lesions.
4. Failure may be due to imperfect technic, carbon adhering to the quartz enclosing the mercury or to the lens.
5. Nevi which fade upon pressure respond more rapidly than those which do not fade, though both types are quite amenable to treatment. All nevi do not react with equal promptness. When there is a complication of thickened connective tissue, prolonged treatment is necessary.
6. Young children respond more rapidly than adults, because the skin and vessel walls are thinner and less mature, hence the activity of the rays is augmented.
7. Enlargement of features, such as lip, nose, etc., due to blood engorgement, sometimes complicating "port-wine" nevi, are reduced by this method.
8. Brunettes require more prolonged treatment than blonds on account of the resistance offered to the rays by the skin pigment.
9. Healthy skin is more susceptible to ultra-violet rays than abnormal skin, and must be protected.
10. This is a safe method for patient and operator.

The Treatment of Intractable Pruritus Ani by Local Anesthetic Methods. W. E. GROUND, Superior, Wis., *The Journal-Lancet*, April 15, 1916.

The author recommends the local injection of quinin and urea hydrochloride. He precedes this by purgation, local disinfection and local anaesthesia by cocain. He injects a 1 per cent. solution of the quinin salt about one inch from the anal margin on a level with the ischial tuberosity. Three injections of a dram each are made at the same sitting, the result being relief for from two to four weeks or some times permanent cure. The details of the method are given.

Cancer of the Lip. W. W. GRANT, Denver. *Journal of the American Medical Association*, April 29.

Grant insists on its early radical excision as giving the only promise of permanent relief and describes his method of operating. The removal of the diseased lip will be the first step, and the sooner this is done the less the danger of distributing the virus by the subsequent manipulations. Safety demands wide excision and as complete removal as possible of submaxillary glands and lymph nodes, regardless of evidence of their being involved. The V incision has no place in surgery unless with a very small growth in a large mouth. The semilunar incision is objectionable, even in small superficial ulcers, for it leaves a depression at the site of the disease and, like the V incision, does not afford the most satisfactory conditions for reconstructing the mouth. The operation is best which involves the fewest incisions for complete work and replaces the diseased lip by soft elastic tissue resembling the original as near as possible with the best cosmetic results. The stationary chin tissue is of great importance as a point of fixation for the sliding flaps, which constitute the reconstructed mouth, and Grant rejects the methods of making the chin flaps of the leading authorities. He again expresses the opinion that his method published in 1899 is the best operative procedure and reproduces the technic in detail. No condition probably requires more attentive and skilful after-treatment. The first dressing should be changed in from twenty-four to thirty-six hours and repeated at these intervals through the week, the mouth being irrigated through the T tube with warm boric acid and normal salt solution. The patient should be nourished with liquids through a feeding tube until the stitches are removed, after a week or ten days.

Tuberculosis of the Mammary Gland. DR. GATEWOOD, Chicago, *Interstate Medical Journal*, April, 1916.

A survey of the available literature leads the author to the following conclusions:

1. Tuberculosis of the mammary gland is very uncommon considering the frequency of tuberculosis.
2. The term "primary tuberculous mastitis" should be applied only to those cases in which there is definite evidence that the infection was introduced directly into the breast tissues.
3. The symptoms are varied and the diagnosis should be made certain by the aid of the microscope before radical operations are undertaken.
4. The pathology, although varied, does not differ essentially from that of tuberculosis in other organs.
5. The treatment is surgical in almost every instance, but the post-operative care of the patient is very essential to complete recovery.
6. The prognosis is excellent provided the general condition of the patient is good.

The Treatment of Tuberculous Adenitis by the Roentgen Rays. R. H. BOGGS, Pittsburgh. *New York Medical Journal*, May 27, 1916.

Boggs believes that the *x*-ray is the method of choice in the treatment of tuberculous adenitis. It is better to use a hard tube and administer small doses over a longer period of time than to try to heal the process by a few treatments with massive doses. Boggs advocates the *x*-ray even in cases that have come to suppuration. The conventional hygienic measures should not be neglected.

Dermoid Tumors of the Mouth. P. K. GILMAN, *Surgery, Gynecology and Obstetrics*, June, 1916.

The author reports a case of a dermoid cyst of the mouth occurring in a Filipino woman 26 years of age. The growth had practically filled the mouth, displacing the tongue upwards and backwards so that its tip was barely seen when protruded as far as possible. Its great size precluded the possibility of determining its origin either from the submental or the sublingual space. There was deglutition difficulty in speech and respiratory embarrassment. The patient had also emaciated considerably. Attempt to remove the growth en masse failed on account of its intimate relation with neighboring structures. The cyst contents were evacuated, a part of the cyst wall removed and the remainder was carbolized. The cavity was packed with gauze. The patient made an uneventful recovery, regaining her weight as the diet was increased. The differentiation from ranula is made chiefly on the ground of the more doughy consistence of the dermoid cyst and its medium situation.

Presenile Gangrene — Thrombo-Angiitis Obliterans. C. GOODMAN and E. P. BERNSTEIN, New York. *New York Medical Journal*, June 3, 1916.

Based upon the observation that this disease is most common in those countries in which typhus fever is prevalent, Goodman conceived the possibility that typhus fever may be the cause of thrombo-angiitis obliterans. To test this view Bernstein made complement fixations of the blood against the recently discovered cause of typhus, the bacillus of Platz, in 21 cases. In three the test was positive in high dilutions. The small percentage of positive results is suggestive, inasmuch as it is well known that patients with typhus may lose their serological reactions within as short a period as five months after the termination of the disease. In many of these patients, Bernstein believes the reaction would be positive if the cases had been studied earlier.